

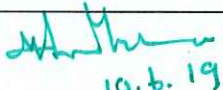
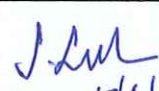
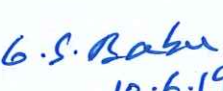
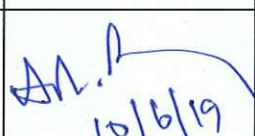
Dr. AMBEDKAR GOVERNMENT ARTS COLLEGE (AUTONOMOUS)
VYASARPADI, CHENNAI – 600 039

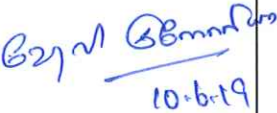
MINUTES OF THE MEETING OF BOARD OF STUDIES IN B.Sc. MATHEMATICS

Date of Meeting: 10th June 2019

- (a) Resolved that the draft syllabus proposed for B.Sc. (Mathematics) by the Department of Mathematics for the students admitted from the academic year 2019-20 has been discussed and approved.
- (b) Resolved that the mandatory areas of the subject recommended by the TANSCHS are incorporated in the syllabus.
- (c) Resolved that the draft syllabus would impart an in-depth knowledge and insight to the subject, will offer exposure to job oriented skills and to work on business related problems.

The following members were present in the B.Sc. Board of Studies meeting held on 10th June 2019.

S. No.	Name of the Member	Designation and Institution	Signature
1.	Dr. (Mrs.) A. Sarojini Chairman	Associate Professor and Head, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10.6.19
2.	Dr. M. Ananthanarayanan University Nominee	Associate Professor, Department of Mathematics, A.M. Jain College, Meenambakkam, Chennai – 114.	 10.6.19
3.	Dr. S. J. Venkatesan Subject Expert	Associate Professor, Department of Mathematics, Government Arts College for Men, Nandanam, Chennai – 35.	 10.6.19
4.	Dr. D. Ramamurthy Subject Expert	Assistant Professor and Head, Department of Mathematics, Sir Theagaraya College, Old Washermenpet, Chennai – 600 021.	 10/6/19.
5.	Mr. Sridhar Subramaniam Industry Representative	Senior Programmer Analyst, Contec India Private Limited, “Shivam Building”, S.No. 257/4B, 200 Feet Radial Road, Chrompet, Chennai – 600 044.	 19/6/19
6.	Dr. O.S. Babu Member	Associate Professor, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10.6.19
7.	Dr. A.R. Ragavan Member	Associate Professor, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10/6/19
8.	Dr. (Mrs.) J. Desdemona Kirubavathi Member	Associate Professor, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10.6.19

S. No.	Name of the Member	Designation and Institution	Signature
9.	Dr. S. Karthigeyan Member	Assistant Professor, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10.6.19
10.	Mr. M. K. Purushoth Kumar Member	Assistant Professor, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10.6.19
11.	Mr. K. Thulukkanam Member	Assistant Professor, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10.6.19
12.	Mr. K. Saravanan Member	Assistant Professor, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10/6/19
13.	Mrs. D. Kalpana Member	Assistant Professor, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10/6/19
14.	Dr. G. Palani Member	Assistant Professor, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10/6/19
15.	Dr. (Mrs.) Shirley Gloria D.K. Member	Assistant Professor, PG and Research Department of Mathematics, Dr. Ambedkar Government Arts College (Autonomous), Vyasarpadi, Chennai – 600 0039.	 10.6.19
16.	Mr. Arun Alumnus	Customer Service Representative, Accenture Block B, TECCI Park, 173, Rajiv Gandhi Salai, Sholinganallur, Chennai – 600 119.	 G.K. Arun

Dr. AMBEDKAR GOVERNMENT ARTS COLLEGE (AUTONOMOUS)
VYASARPADI, CHENNAI - 600 039

(AFFILIATED TO UNIVERSITY OF MADRAS)

Choice Based Credit System (CBCS)

B.A. / B.Sc. / B.Com. / B.B.A. DEGREE COURSE

(With effect from the Academic year 2019 – 2020)

Dr. Ambedkar Government Arts college (Autonomous) offers the semester System of education with credits for UG courses. Credit is related to the number of hours a teacher teaches a particular subject as well as to the number of hours a student spends learning a subject or carrying out an activity. In the semester system of study, every academic year is divided into two semester sessions. Each semester will have a minimum of 90 working days and each day will have 5 working hours.

Differential weightage is given according to the content and duration of the course in the curriculum design. Each course is designed variously under lectures/ tutorials/ laboratory/ work/ seminar/ project work/ practical training/ viva, etc., to facilitate effective teaching and learning and the credits are assigned accordingly depending on the content and the specialization.

Regulations

(Effective from the Academic year 2019-2020 onwards)

1. Eligibility for Admission:

Candidates for admission to the Degree of Bachelor of Science, Arts and Commerce shall be required to have passed the Higher Secondary Examination (Academic or Vocational stream), conducted by the Government of Tamil Nadu, or an examination accepted as equivalent thereto by the Syndicate of the University of Madras.

2. Eligibility for the award of Degree:

A Candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study in a college affiliated to the University for a period of not less than three academic years, passed the examination of all the six semesters prescribed earning 140 credits including 2 credits for Environmental Studies, 2 credits for Value Education and 1 credit for the compulsory Extension Services prescribed.

3. Duration

Each academic year shall be divided into two semesters. The first academic year shall comprise the first and second semester, the second academic year the third and the fourth semester and the third academic year the fifth and sixth semester respectively.

The odd semester shall consist of the period from June to November of each academic year and the even semester from December to April of each academic year. There shall be not less than 90 working days for each semester.

4. Programmes offered

a) Arts (B.A)

- 1. English**
- 2. Economics**
- 3. Defence & Strategic Studies**
- 4. Tamil**

b) Science (B.Sc)

- 1. Mathematics**
- 2. Chemistry**
- 3. Advanced Zoology and Bio-Technology**
- 4. Computer Science**
- 5. Physics**
- 6. Statistics**
- 7. Plant Biology and Bio-Technology**
- 8. Home Science- Nutrition, Food Service Management**
- 9. Visual Communication**
- 10. Psychology**

c) Commerce

- 1. B.Com (General)**

d) Business Administration

- 1. B.B.A (Financial Management)**

5.The CBCS System

All Programmes (named after the Core subject) mentioned earlier are based on Choice Based Credit System (CBCS). It is an instructional package developed to suit the needs of students to keep pace with the developments in higher education and the quality assurance expected of it in the light of liberalization and globalization in higher education.

6.Course of Study

The UG programme consists of several courses. The term ‘course’ is applied to indicate a logical part of the subject matter of the programme and is invariably equivalent to the subject matter of a “paper” in the conventional sense.

The following are the various categories of Courses suggested for the UG programmes. Language Course (LC) (Tamil), English Language Course (ELC), Core Course (CC), Allied Courses (AC), Allied Practical (ACP), Elective Courses (EC) (instead of Applied Course in the curriculum followed earlier), Non-major elective courses (NME), Skill based Elective courses (SS), Environmental studies (ES), Value Education (VE) and Extension Activity (EA).

7. Credits

The term ‘Credit’ refers to the weightage given to a course, usually in relation to the instructional hours assigned to it. For instance, the course with six hour per week is assigned four

credits, course with four / five hour per week is assigned three credits and course with two hour per week is given two credits. However, in no instance the credits of a course can be greater than the hours allotted to it. The total minimum credits, required for completing the UG program is 140.

The details of credits for individual components and individual courses are given below:

Study Components	No.of Courses	Credit per Course	Total Credits
Part-I Tamil/ Other Languages	2+2=4	3	12
Part-II English	2+2=4	3	12
Part-III Core Courses Allied Courses	13-15 4	4-5 5	60 20
Project/Electives with three Course	3	5	15
Part-IV 1. (a) Those who have not studied Tamil upto XII Standard and taken a non-Tamil Language under Part-I shall take Tamil comprising of two courses(level will be at 6 th standard) (b) Those who have studied Tamil upto XII Standard and taken a non-Tamil Language under Part-I shall take advanced Tamil comprising of two courses (c) Others who do not come under a+b can choose non-major elective comprising of two courses	1+1=2	2	4
2. Skill based courses (Elective)	2+2	3	12
3. Environmental Studies	1	2	2
4. Value Education	1	2	2
Part-V Extension Activities	1	1	1
Total			140

IV (3) & (4) Environmental Studies and Value Education:

All the students shall have to undergo a course on Environmental Studies during III Semester and Value education during IV Semester.

V Extension Activity

All the students shall have to enroll for NSS/NCC/NSO (Sports & Games) Rotract/ Youth Red Cross or any other service organizations in the college and shall have to put in

compulsory minimum attendance of 40 hours which shall be duly certified by the Principal of the College before 31st March in a year. If a student LACKS 40 HOURS ATTENDANCE in the First Year, he/ shall have to compensate the same during the subsequent years.

Students those who complete minimum attendance of 40 hours in One year will get HALF A CREDIT and those who complete the attendance of 80 or more hours in Two Years will get ONE CREDIT.

Literacy and Population Education Field work shall be compulsory components in the above extension service activities.

8. Selection of candidates to Non-Major Elective Courses and Skill based Elective Courses

The Non-Major and skill based elective Courses 2+4 in numbers for each UG degree, are open to all students irrespective of science, Arts or Commerce Programmes. A student shall choose at least two Non-Major Elective Courses and three skill based elective courses from outside his / her Department.

Selection of student to the EC (NME & SS):

- a. The Department Committee shall follow a selection procedure on a first come first served basis, fixing the maximum number of students, giving counseling to the students etc. to avoid overcrowding to particular course(s) at the expense of some other courses.
- b. The failed candidates in one EC are permitted to opt for another EC in another programme or they are permitted to continue with the same EC.
- c. The College shall provide all information relating to the ECs in each programme to all the students so as to enable them to choose their ECs.

9. Attendance:

A Candidate shall be permitted to appear for the examinations only if he or she secures not less than 75% attendance in each subject / paper.

Students who have 74% to 60% of attendance shall apply for condonation in the prescribed form with the prescribed fee Rs.250/- each for Theory/Practical examination towards the condonation of shortage of attendance.

Students who have secured less than 60% but more than 50% of attendance are NOT Eligible for condonation of shortage of attendance and such candidates will not be permitted to appear for the regular examination, but will be allowed to proceed to the next year / next Semester of the course and they may be permitted to take next End Semester Examination by paying the prescribed condonation fee of Rs.250/- each for Theory/Practical separately.

Students who have below 50% of attendance are not eligible to appear for the examination. They shall re-do the semester(s) after completion of the programme by paying the fee for the break of study as prescribed by the academic council from time to time.

10. Conduct of Examination:

Examination will be conducted by the college at the end of each semester. A candidate who does not pass the examination in any paper(s) shall be permitted to appear in such failed paper(s) in the subsequent examinations.

11. Scheme of Examinations: Theory:

Continuous Assessment	: 25 Marks
End semester Examination	: 75 Marks

Total	:100 Marks
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The break up for continuous Assessment is as follows:

a) Test	(1 x 10) : 10 Marks
b) Assignment	(1 x 10) : 10 Marks
c) Model Examination	(1 x 25) : 25 Marks
d) Attendance	: 5 Marks

Total	: 50 Marks
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50 Marks for continuous assessment can be converted to 25 Marks.

For Major and Allied Practicals:

The breakup of marks for continuous assessment year end practical examination is as follows:

Continuous Assessment	: 25 Marks
Practical	: 75 Marks

Total	: 100 Marks
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The break up for continuous assessment for major and Allied Practical's are

a. Submission of Record/Observation	: 50 Marks (40 + 10(Attendance))
b. Practical Tests (2 x 15)	: 30 Marks
c. Model Practical Examination	: 20 Marks

Total	: 100 Marks
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The total marks will be converted to 25 Marks.

The duration of the academic year end practical examinations for each paper shall be 3 hours carrying 75 Marks.

12. Requirements for proceeding to subsequent Semester

a. Candidates shall register their names for the First Semester Examinations after the admission in the UG Courses.

b. Candidates shall be permitted to proceed from the First Semester up to Final semester irrespective of their failure in any of the semester Examinations subject to the condition that the candidate should register for all the arrear papers of earlier semester along with current (subsequent) semester papers.

c. Candidates shall be eligible to go to subsequent semester, only if they earn sufficient attendance as prescribed, from time to time, by the University of Madras.

Provided in case of a candidate earning less than 50% of attendance in any one of the semester due to any extraordinary circumstance such as medical grounds, such candidate who shall produce medical certificate issued by the Authorized Medical Attendant (AMA), duly certified by the Principal of the College, shall be permitted to proceed to the next semester and to complete the Course of study. Such candidates shall have to repeat the missed Semester by rejoining after completion of Final Semester of the Course, after paying the fee for the break of study as prescribed from time to time.

13. Valuation of Answer Papers:

For undergraduate courses, only single valuation is permissible. Re-totaling and revaluation of theory papers are allowed. The fee prescribed for Re-totaling is Rs.250/- per paper and for revaluation Rs.500/- per script. Photo copy of the Answer scripts will be supplied to the candidate applying for revaluation.

14. Passing Minimum

a. There shall be no Passing Minimum for Internal.

b. For External Examination, Passing Minimum shall be of 40% (Forty Percentage) of the maximum marks prescribed for the paper for each Paper/Practical/Project and Viva voce.

c. In the aggregate (External + Internal) the passing minimum shall be of 40%.

d. He / She shall be declared to have passed the whole examination, if he/she passes in all the papers and practicals wherever prescribed / as per the scheme of examinations by earning 140 CREDITS in Parts-I, II, III, IV & V. He/she shall also fulfill the activities prescribed earning a minimum of 1 Credit to qualify for the Degree.

15. Classification of successful candidates:

Grading system:

The following table gives the marks, grade points, letter grades and classification to indicate the performance of the candidate.

Conversion of Marks to Grade Points and Letter Grade (Performance in a Course/ Paper)

RANGE OF MARKS	GRADE PONTS	LETTER GRADE	DESCRIPTION
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction
70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Average
40-49	4.0-4.9	C	Satisfactory
00-39	0.0	RA	Re-appear
ABSENT	0.0	AAA	ABSENT

‘C_i’ is the credit earned for the course *i* in any semester;

‘G_i’ is the Grade Point obtained by the student for the Course *i* and ‘*n*’ is the number of Courses **passed** in that semester.

For a Semester:

$$\text{Grade Point Average [GPA]} = \frac{\text{Sum of the multiplication of the grade points by the credits of the courses}}{\text{Sum of the credits of the courses in a semester}}$$

$$\text{GPA} = \sum_i C_i G_i / \sum_i C_i$$

16. Classification of Final Results

$$\begin{aligned} \text{Cumulative Grade Point Average [CGPA]} \\ = \frac{\text{Sum of the multiplication of grade points by the credits of the entire programme}}{\text{Sum of the credits of the courses of the entire programme}} \end{aligned}$$

$$\text{CGPA} = \sum_n \sum_i C_{ni} G_i / \sum_n \sum_i C_{ni}$$

CGPA	GRADE	Classification of Final Result
9.5-10.0	O+	First Class Exemplary
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
4.5 and above but below 5.0	C+	Third Class
4.0 and above but below 4.5	C	
0.0 and above but below 4.0	RA	Re-appear

Note: The GPA and CGPA shall be calculated separately for the following three parts:

Part I: LCs; Part II: ELCs and Part III CCs, ACs and ECs.

(i) Candidates who pass all the examinations prescribed for the Course in the FIRST APPEARANCE ITSELF ALONE are eligible for classification/ Ranking/Distinction.

Provided in the case of Candidates who pass all the Examinations prescribed for the Courses with a break in the First Appearance due to the reasons as furnished in the Regulations 12c supra are only eligible for Classification/ Distinction.

(ii) For each of the three parts, there shall be separate classification on the basis of CGPA as indicated in the above Table.

(iii) For purposes of declaring a candidate to have qualified for the Degree of Bachelor of Arts/Science/ Commerce/Management/Literature in the First class/Second class/Third class or First class with Distinction / Exemplary, the marks and the corresponding CGPA earned by the candidate in Part III alone will be the criterion, provided he/she has secured the prescribed passing minimum in LCs and ELCs.

(iv) Grade in Part IV and Part V shall be shown separately and it shall not be taken into account for classification.

17. Pattern of Question Paper:

SECTION – A (30 words)

To Answer 10 out of 12 Questions $10 \times 2 = 20$ marks

SECTION – B (200 words)

To Answer 5 out of 8 Questions $5 \times 5 = 25$ marks

SECTION – C (500 words)

To Answer 3 out of 5 Questions $3 \times 10 = 30$ marks

TOTAL **= 75 marks**

Sem. No.	Part Number	Course	Subject Code	Course Title	Ins. Hrs/ Week	Credit	Exam Hrs.	Marks		Total
								Int.	Ext.	
I	I	LC – I		Language Course - I	6	3	3	25	75	100
	II	ELC – I		English - I	4	3	3	25	75	100
	III	CC – I		Classical Algebra and Number Theory	5	4	3	25	75	100
	III	CC – II		Differential Calculus	4	4	3	25	75	100
	III	AC – I		Allied Chemistry – I	4	5	3	25	75	100
	III	ACP – I		Allied Chemistry Practical	3	-	-	-	-	-
	IV	SS – I		Essentials of Language and Communication	2	3	3	25	75	100
	IV	NME – I		Analytical Skills and Aptitude	2	2	3	25	75	100
II	I	LC – II		Language Course - II	6	3	3	25	75	100
	II	ELC – II		English - II	4	3	3	25	75	100
	III	CC – III		Trigonometry and Analytical Geometry – three dimensional	5	4	3	25	75	100
	III	CC – IV		Integral Calculus and Fourier Series	4	4	3	25	75	100
	III	AC – II		Allied Chemistry – II	4	5	3	25	75	100
	III	ACP – I		Allied Chemistry Practical	3	-	-	-	-	-
	IV	SS – II		Essentials of Spoken and Presentation skill	2	3	3	25	75	100
	IV	NME – II		Functional Mathematics	2	2	3	25	75	100
III	I	LC – III		Language Course - III	6	3	3	25	75	100
	II	ELC – III		English - III	4	3	3	25	75	100
	III	CC – V		Differential Equations and Laplace Transforms	4	4	3	25	75	100
	III	CC – VI		Mathematical Statistics	5	4	3	25	75	100
	III	AC – III		Allied Physics – I	4	5	3	25	75	100
	III	ACP – II		Allied Physics Practical	3	-	-	-	-	-

	IV	SS – III		Personality Enrichment	2	3	3	25	75	100
	IV	ES		Environmental Studies	2	2	3	25	75	100
IV	I	LC – IV		Language Course – IV	6	3	3	25	75	100
	II	ELC – IV		English – IV	4	3	3	25	75	100
	III	CC – VII		Vector Calculus	4	4	3	25	75	100
	III	CC – VIII		Mechanics – I	5	4	3	25	75	100
	III	AC – IV		Allied Physics – II	4	5	3	25	75	100
	III	ACP – II		Allied Physics Practical	3	-	-	-	-	-
	IV	SS – IV		Computer Basics and Office Automation	2	3	3	25	75	100
	IV	VE		Value Education	2	2	3	25	75	100
	V	EA		Extension Activities (NCC/NSS/Sports)	-	1	-	-	-	-
V	III	CC – IX		Abstract Algebra	6	4	3	25	75	100
	III	CC – X		Real Analysis – I	6	4	3	25	75	100
	III	CC – XI		Mechanics – II	6	4	3	25	75	100
	III	CC – XII		Operations Research	6	4	3	25	75	100
	III	EC – I		One from the Elective Subjects	6	5	3	25	75	100
VI	III	CC – XIII		Linear Algebra	6	4	3	25	75	100
	III	CC – XIV		Real Analysis – II	6	4	3	25	75	100
	III	CC – XV		Complex Analysis	6	4	3	25	75	100
	III	EC – II		One from the Elective Subjects	6	5	3	25	75	100
	III	EC – III		One from the Elective Subjects	6	5	3	25	75	100
				Total credit		140				

Elective Subjects

S. No.	Subjects	Code
1	Elementary Number Theory	
2	Resource Management Techniques	
3	Programming Language in 'C' (Theory and Practical)	
4	Numerical Methods	
5	Graph Theory	
6	Partial Differential Equations with Applications	

Non – Major Electives

S. No.	Subjects	Code
1	Analytical Skills and Aptitude	
2	Functional Mathematics	

SEMESTER-I

Language Course - I
English - I
Classical Algebra and Number Theory
Differential Calculus
Allied Chemistry – I
Allied Chemistry Practical
SS – I (Essentials of Language and Communication)
NME – I (Analytical Skills and Aptitude)

Semester I

Core Subject: Paper I

Title : Classical Algebra and Number Theory

Subject code :

Credits : 4

Hours : 5

Unit I: Symmetric, skew symmetric, Hermitian, Skew Hermitian, Orthogonal and Unitary matrices. Cayley- Hamilton theorem (Without proof) – Eigen values, Eigen vectors.

Unit II: Theory of equations: Formation of equations - Polynomial equations imaginary and irrational roots - Relations between roots and coefficients - symmetric functions of roots in terms of coefficients.

Unit III: Reciprocal equations; Transformation of equations – multiplication of roots, diminishing the roots – Descartes rule of signs - Approximate solution of roots by Horner's method.

Unit IV : Theory of numbers: Divisibility of integers – Division Algorithm – GCD – Euclidian algorithm – prime numbers – composite numbers – fundamental theorem of arithmetic (without proof) – divisors of a positive integer N – Euler's function $\phi(N)$ – formula for $\phi(N)$ (without proof) – highest power of prime p contained in $n!$.

Unit V : Congruences – Fermat's and Wilson's theorem (without proof) – simple problems.

Books for reference :

1. T.K. Manicavachagom Pillay, T. Natarajan and K.S.Ganapathy, "Algebra", Viswanathan Publishers and Printers Pvt Ltd., - 2004.
2. Kandasamy, P and K. Thilagavathi – "Mathematics for B.Sc., - 2004", S.Chand and Co., New Delhi.
3. P.R. Vittal, "Algebra and Trigonometry", Margam Publications.
4. Arumugam S., Thangapandi Isaac A., "Classical Algebra", New Gamma Publishing House, Palayamkottai.
5. David N. Burton, "Elementary Number Theory", 6th Edition, Tata McGraw Hill Publishers, 2008.

Semester I

Core Subject: Paper II

Title : Differential Calculus

Subject code :

Credits : 4

Hours : 4

Unit I: Introduction to differentiation - nth derivatives, Leibnitz's theorem and its applications.

Unit II: Curvature and radius of curvature: radius of curvature in Cartesian, Parametric and Polar coordinates – simple problems.

Unit III: Pedal equations, Involutives and Evolutes.

Unit IV: Envelopes and Asymptotes.

Unit V: Jacobians, maxima and minima of functions of 2 and 3 variables, Lagrange's method – simple problems.

Books for reference:

1. Narayanan, S and T.K. Manickavasagam Pillai, "Calculus", Volume I (2004), Volume II (2004), S.Viswanathan Printers Pvt. Ltd., Chennai
2. P.R.Vittal and V.Malini, "Calculus and Differential Geometry", Margham Publications, Chennai.
3. Kandasamy, P and K. Thilagavathi, "Mathematics for B.Sc., - Volume II – 2004", S.Chand & Co., New Delhi.
4. Arumugam S., Thangapandi Isaac A., "Calculus", New Gamma Publishing House, Palayamkottai.

SEMESTER-II

Language Course - II
English - II
Trigonometry and Analytical Geometry – three dimensional
Integral Calculus and Fourier Series
Allied Chemistry – II
Allied Chemistry Practical
SS-II (Essentials of Spoken and Presentation skill)
NME – II (Functional Mathematics)

Semester II

Core subject : Paper III

Title : Trigonometry and Analytical Geometry – three dimensional

Subject code :

Credits : 4

Hours : 5

Unit I: Expansion of $\sin nx$, $\cos nx$, $\tan nx$, $\sin^n x$, $\cos^n x$, Expansion of $\sin x$, $\cos x$ and $\tan x$ in ascending powers of x .

Unit II: Hyperbolic functions - Definition, Relation between Hyperbolic functions, Inverse Hyperbolic functions, Logarithm of complex quantities.

Unit III: Summation of infinite series that can be expressed in C+iS form: 1. Binomial Series, 2. Exponential Series, 3. Logarithmic Series.

Unit IV: Sphere: Tangent Plane - Circle of intersections - Tangency of Spheres - Coaxial System of Spheres - Radical Planes - Orthogonal Spheres.

Unit V: Cone: Equation of a Cone - Cone with Vertex at the origin - Quadric cone with the vertex at the origin – Right circular cone .

Books for reference :

1. T. K. Manicavachogam Pillai and T.Natarajan , “Trigonometry”, S.Viswanathan Publishers and Printers Pvt. Ltd., Chennai.
2. Duraipandian. P., Laxmi Duraipandian and D. Jayamala Paramasivan, “Trigonometry”, Emerald Publishers.
3. Arumugam S., Thangapandi Isaac A., “Trigonometry”, New Gamma Publishing House, Palayamkottai
4. Duraipandian. P., Laxmi Duraipandian and D.Muhilan (Revised Edition - Reprint - 2003) “Analytical Geometry (Three Dimensions)”, Emerald Publishers.
5. T. K. Manicavachogam Pillai and T.Natarajan , “Analytical Geometry 3-Dimensions”, S.Viswanathan Publishers and Printers Pvt. Ltd., Chennai.

Semester II
Core subject : Paper IV
Title : Integral Calculus and Fourier Series
Subject code :
Credits : 4
Hours : 4

Unit I: Properties of definite integrals, Bernoulli's formula and Reduction formulae.

Unit II: Double and Triple integrals, Changing the order of integration, Change of variables, Applications of Double and Triple integrals in finding area and volume (Cartesian coordinates only).

Unit III: Beta and Gamma functions: Definitions and properties.

Unit IV: Fourier series : Definition, Finding Fourier coefficients for a given periodic function with given period 2π .

Unit V: Fourier series for odd and even functions – Half-range series in $(0,\pi)$.

Books for reference:

1. S.Narayanan and T.K.Manicavachogam pillay, “Calculus”, S.Viswanathan Publishers, Chennai.
2. P.R.Vittal and V.Malini, “Calculus and Differential Geometry”, Margham Publications, Chennai.
3. M. K. Venkataraman, “Engineering Mathematics – III”, National Publishing House, Chennai.

SEMESTER-III

Language Course - III
English - III
Differential Equations and Laplace Transforms
Mathematical Statistics
Allied Physics – I
Allied Physics Practical
SS – III (Personality Enrichment)
Environmental Studies

Semester III

Core subject : Paper V

Title : Differential Equations and Laplace Transforms

Subject code :

Credits : 4

Hours : 4

Unit I: First order differential equations but of higher degree; solvable for p , solvable for x , solvable for y , Clairaut's form.

Unit II : Second order ordinary differential equations with constant coefficients: RHS of the form e^{ax} V where V is x^m (m is a positive integer), $\cos bx$, $\sin bx$, Second order ordinary differential equations with variable coefficients – Method of variation of parameters – simple problems.

Unit III : Partial differential equations : Formation by eliminating arbitrary constants and arbitrary functions; complete integral; singular integral; general integral; the standard types $f(p,q) = 0$, $f(x,p,q) = 0$, $f(y,p,q) = 0$, $f(z,p,q) = 0$, $f(x,p) = f(y,p)$; Clairaut's form, Lagrange's equation $Pp + Qq = R$ – simple problems.

Unit IV : Laplace Transforms ; Inverse Laplace Transforms (usual types) – simple problems.

Unit V : Applications of Laplace Transforms to solution of first and second order linear differential equations(with constant coefficients only) – simple problems.

Books for reference :

1. S. Narayanan, T.K. Manicavachagam Pillay, "Differential Equations and its applications", S.Viswanathan publications.
2. P.R. Vittal, V.Malini, "Differential equations and Laplace Transforms", Margam Publications.
3. P.Kandasamy, K. Thilagavathi, "Mathematics for B.Sc., Vol III-2004", S.Chand and Co., New Delhi.
4. Arumugam S., and Isaac A., "Differential Equations and Applicatoins", New Gamma Publishing House, Palayamkottai, 2014.

Semester III

Core subject : Paper VI

Title : MATHEMATICAL STATISTICS

Subject code :

Credits : 4

Hours : 5

Unit I: Probability: Definitions of various terms - Axiomatic Probability - Random Event - Mathematical Probability - Addition and Multiplication Laws of Probability - Independent events - Conditional Probability – Baye’s theorem - Simple applications.

Unit II: Random Variables: Distribution functions - Discrete random variable - Continuous random variable - Joint Probability mass function Joint Probability distribution function - Marginal distribution function - Joint density function -conditional distribution function.

Unit III: Mathematical Expectation: Addition and Multiplication theorem - Covariance Expectation and variance of linear combination of random variables - Moment generating function - Characteristic function.

Unit IV: Sampling Distributions: Testing statistical hypothesis: Null and alternate hypothesis – Type I and Type II errors – Powers of a test – Critical region – Level of significance – One/two tailed tests critical value. Large sample test: Test of significance for single mean and difference of means - Test of significance for single proportion and difference of proportions.

Unit V: Small sample test: Students t-distribution, F-distribution - χ^2 - distribution (Definition only). Tests based on t (single mean, difference of means and paired t-test), F (difference between two variances) and χ^2 (independence of attributes only) distributions.

Text Book:

Gupta.S.C.& V.K. Kapoor – Fundamentals of Mathematical statistics – 2002 Sultan Chand & Sons, New Delhi – Eleventh thoroughly revised edition.

Books for Reference:

1. Kandasamy, P.,K.Thilagavathi and K. Gunavathi, Probability, Statistics and Queueing theory – (2007) S.Chand and Co., New Delhi.
2. Vittal.P.R. Mathematical Statistics – 2004 – Maragatham Publishers.
3. Arumugam and Issac-Statistics , New Gamma Publishing House, 2016.
4. Veerarajan T. Fundamentals of Mathematical Statistics, Yesdee Publishing Private Ltd. 2017.

SEMESTER-IV

Language Course – IV
English – IV
Vector Calculus
Mechanics – I
Allied Physics – II
Allied Physics Practical
SS – IV (Computer Basics and Office Automation)
Value Education
Extension Activities (NCC/NSS/Sports)

Semester IV

Core subject : Paper VII

Title : Vector Calculus

Subject code :

Credits : 4

Hours : 4

Unit I: Vector point function - Scalar point function – Derivative of vector and derivative of sum of vectors – derivative of product of scalar and vector point function – derivative of scalar and vector product.

Unit II: Introduction - The vector operator ∇ - Gradient of a scalar point function - Divergence of a vector - Curl of a vector - Definitions of solenoidal and irrotational vectors , directional derivative, unit normal to the surface, tangent and normal plane.

Unit III: Laplacian operator – vector identities – simple problems.

Unit IV: Line integral - Surface integral - Volume integral

Unit V: Stokes Theorem, Gauss-divergence Theorem, Green's Theorem in two dimensions(without proof) – simple problems.

Books for reference :

1. S. Narayanan,T.K. Manicavachagam Pillay, “Vector analysis”, S.Viswanathan publications.
2. Vector Analysis : P.Duraipandian, Laxmi Duraipandian, Emerald Publishers
3. Vector Analysis : P.R.Vittal and Malini, Margham Publishers.

Semester IV

Core subject : Paper VIII

Title : Mechanics - I

Subject code :

Credits : 4

Hours : 5

Unit I: Force: Newton's laws of motion: Forces – Types of forces, Resultant of two forces on a particle: Resultant of three forces related to a triangle acting at a point – Resultant of several forces acting on a particle, Equilibrium of a particle: equilibrium of a particle under three forces - under several forces.

(Sections: 2.1, 2.2, 3.1)

Unit II: Forces on a rigid body: moment of a force: moment of a force about a line - scalar moment, Parallel forces: point of application of resultant of many parallel forces – Varignon's theorem - parallel forces at the vertices of a triangle, forces along the sides of a triangle – simple Problems.

(Sections: 4.1, 4.4, 4.5)

Unit III: Couples: moment of a couple - arm and axis of a couple, Resultant of several coplanar forces: moment of a certain couple as an area – couples in a parallel planes – Resultant of a couple and a force, equation of the line of action of the resultant: Sum of the moments about an arbitrary point.

(Sections: 4.6, 4.7, 4.8)

Unit IV: Equilibrium of a rigid body under three coplanar forces: cotangent formula. A specific reduction of forces: reduction of coplanar forces into a force and a couple – conditions of equilibrium under coplanar forces. Problems involving frictional forces – simple problems.

(Sections: 4.9, 5.1, 5.2 (omit 5.2.1))

Unit V: Centre of mass – centre of gravity – finding mass centre (not using integration), finding mass centre using integration-simple problems.

(Sections: 6.1, 6.2.1, 6.2.2)

Text Book:

Mechanics: P.Duraipandian & others – S.Chand &Co.

Books for reference:

1. Statics : S.Narayanan and others S.Chand &Co.
2. A text book of Statics: M.K.Venkataraman, Agastiar Publications, Trichy, 2002.

SEMESTER-V

Abstract Algebra
Real Analysis – I
Mechanics – II
Operations Research
One from the Elective Subjects

Semester V

Core subject : Paper IX

Title : Abstract Algebra

Subject code :

Credits : 4

Hours : 6

Unit I: Definition and some examples of groups – preliminary lemmas of groups - subgroups with examples- A counting principle.

UnitII: Normal Subgroups and Quotient groups – Homomorphisms.

Unit III: Automorphisms - Cayley's Theorem- Permutation Groups.

Unit IV: Rings – Definition and examples –Some special classes of Rings – Homomorphisms – Ideals and Quotient Rings.

Unit V: More ideals and Quotient Rings – The Field of Quotients of an Integral Domain – Euclidean Rings.

Contents and Treatment as in :

Topics in Algebra by I.N.Herstein-Wiley EasternLtd.,

Unit I: Chapter 2 : Sections 2.1 to 2.5

Unit II: Chapter 2: Sections 2.6 to 2.7.

Unit III: Chapter 2: Sections 2.8 to 2.10.

Unit IV: Chapter 3 : Sections 3.1 to 3.4.

Unit V: Chapter 3: Sections 3.5 to 3.7.

Books for reference:

1. Algebra – S.Arumugam –New Gamma Publishing House, Palayamkottai.
2. A Text Book of Modern Algebra – Dr. M.L. Santiago - Tata Mcgraw Hill.

Semester V
Core subject : Paper X
Title : Real Analysis I
Subject code :
Credits : 4
Hours : 6

Unit I : Functions – Real valued functions – Equivalence – Countability – Real numbers – Least upper bounds. Sequence of real numbers- Definition of sequence and subsequence – Limit of a sequence – Convergent sequences – Divergent Sequences.

(Sections 1.3 to 1.7 and sections 2.1 to 2.4)

Unit II : Bounded sequences – monotone sequences – operations on convergent sequences – operations on divergent sequences – Limit superior and limit inferior– Cauchy sequences. (Sections 2.5 to 2.10)

Unit III : Sequences of real numbers: Series of real numbers – Convergence and divergence– series with nonnegative terms– alternating series– conditional convergence and absolute convergence– test for absolute convergence– Series whose terms form a non increasing sequence.

(Sections 3.1 to 3.4, 3.6, 3.7)

Unit IV : The class $\mathbb{R}^2$ – Schwarz inequality and Minkowski inequality. Limits and Metric spaces – limit of a function on the real line – metric spaces - limits in metric spaces.

(Sections 3.10, 4.1 to 4.3)

Unit V : Continuous functions on Metric Spaces – Functions continuous at a point on the real line – reformulation– functions continuous on a Metric Space–open sets– closed sets.

(sections 5.1 to 5.5)

Content and Treatment as in:

Richard R. Gold Berg, “Methods of Real Analysis”, John Wiley and sons.

Books for reference :

1. Walter Rudin, “Principles of Mathematical Analysis”, Mc-Graw Hill Book Co.
2. Tom. M. Apostol, “Mathematical Analysis”, Narosa Publishing House.

Semester V
Core subject : Paper XI
Title : Mechanics - II
Subject code :
Credits : 4
Hours : 6

Unit I: Kinematics – velocity, resultant of velocities, relative velocity, acceleration, velocity and acceleration in a rectilinear motion, coplanar motion, angular velocity, relative angular velocity, rectilinear motion when the acceleration is constant.

Unit II: Simple harmonic motion – Geometrical representation – composition of two simple harmonic motions – Particle suspended in a spring– Simple pendulum–simple problems. Projectiles – Equation of path – time of flight – greatest height– horizontal range – Range on an inclined plane – simple problems.

Unit III: Impact – direct and oblique impacts – Impact on a smooth fixed plane – simple problems.

Unit IV: Motion under central force – Differential equation of a central orbit in polar coordinates and in $p - r$ coordinates, inverse square law – simple problems.

Unit V: Moment of Inertia – theorem of perpendicular axes and parallel axes, moment of inertia of uniform bodies: thin rod, rectangular lamina, circular ring, circular disc, elliptic lamina, solid sphere, hollow sphere, solid cone and hollow cone.

Recommended Text:

Mechanics – P. Duraipandian, Laxmi Duraipandian and Muthamizh Jayapragasam – S.Chand &Co.

Books for reference :

1. Mechanics – S.G. Venkatachalapathy –Margam Publishers
2. Dynamics – M.K. Venkataraman, National Publishing Co.

Semester : V

Core Subject: XII

Title : Operations Research

Subject code :

Credits : 5

Hours : 6

Unit I: Introduction to Operations Research – Linear Programming – formulation – graphical solution – Simplex Method.

Unit II: Big M – Method – Duality – Primal and Dual problems – Dual Simplex Method.

Unit III: Game Theory – Two people zero – sum game with saddle point and without saddle point – dominance property – solving $2 \times n$ and $m \times 2$ game by graphical method.

Unit IV: Transportation problem – Northwest corner rule –Least cost method – Vogel's Approximation method – MODI method – stepping stone method - Degeneracy – unbalanced transportation problem.

Unit V: Assignment problem – Hungarian Method – Unbalanced assignment problem – Travelling salesman problem.

Books for Reference:

1. KantiSwarup, P.K. Gupta and Manmohan - Operations Research - Sultan Chand & Sons – 2006, 12th edition.
2. Gupta.P.K.and D.S. Hira – Operations Research - S.Chand and Company.
3. Resource Management Techniques: V.Sundaresan, K.S. Ganapathy Subramanian and K.Ganesan, A.R.Publications, Chennai.

SEMESTER-VI

Linear Algebra
Real Analysis – II
Complex Analysis
One from the Elective Subjects
One from the Elective Subjects

Semester VI

Core subject : Paper XIII

Title : Linear Algebra

Subject code :

Credits : 4

Hours : 6

Unit I: Vector Spaces: Elementary basic concepts- Linear dependence and bases

Unit II: Dual spaces- Inner Product Spaces.

Unit III: Linear Transformations: The Algebra of Linear transformations.

Unit IV: Characteristic roots-Matrices.

Unit V: Canonical Forms – Triangular form.

Contents and Treatment as in :

Topics in Algebra – I.N.Herstein – Wiley Eastern Ltd.

Chapter 4 : sections 4.1 to 4.4, Chapter 6 : Sections 6.1 to 6.4.

Books for reference :

1. A Text Book of Modern Algebra – M.L.Santiago, Tata McGraw-Hill.
2. Algebra – S.Arumugam, New Gamma Publishing House, Palayamkottai.

Semester VI
Core subject : Paper XIV
Title : Real Analysis - II
Subject code :
Credits : 4
Hours : 6

Unit I: More about open sets-Connected sets-Bounded sets and totally bounded sets.
(Sections 6.1 to 6.3)

Unit II: Complete metric spaces-compact metric spaces continuous functions on compact metric spaces continuity of inverse function- uniform continuity.
(Sections 6.4 to 6.8)

Unit III: Calculus: Sets of measure zero- definition of the Riemann Integral- existence of Riemann Integral (statement only)- properties of Riemann Integral.
(sections 7.1 to 7.4)

Unit IV: Derivatives- Rolle's Theorem, Law of Mean- Fundamental Theorems of Calculus- Taylor's Theroem.
(Sections 7.5 to 7.8, 8.5)

Unit V: Sequence and series of functions: Pointwise convergence uniform convergence of sequence of functions.
(Sections 9.1 , 9.2)

Content and Treatment as in:

Richard R. Gold Berg, "Methods of Real Analysis", John Wiley and sons.

Books for reference :

1. Walter Rudin, "Principles of Mathematical Analysis", Mc-Graw Hill Book Co.
2. Tom. M. Apostol, "Mathematical Analysis", Narosa Publishing House.

Semester VI

Core subject : Paper XV

Title : Complex Analysis

Subject code :

Credits : 4

Hours : 6

Unit I: Functions of a complex variable – Theorems on Limits – Derivatives – C-R equations – Sufficient conditions – Analytic functions – Harmonic functions.

Unit II: Riemann's definition of contour integrals – Cauchy's theorem (Proof using Green's theorem only) – Cauchy's integral formula – Formula for higher derivatives – Cauchy's inequality – Liouville's theorem – Fundamental theorem of Algebra.

Unit III: Taylor's series – Laurent's series – Zeros of an analytic function – Types of singularities.

Unit IV: Residues – Cauchy's Residue theorem – Evaluation of integrals around a unit circle – Evaluation of improper real integrals with poles not on the real axis.

Unit V: Transformations – Conformal mappings - basic properties – Mappings $w = 1/z$, $w = z^2$, $w = e^z$ - Bilinear Maps- Fixed points.

Content and Treatment as in :

Complex Variables and Applications, 5th Edition, R.V. Churchill
& J.W. Brown, McGraw – Hill International Book co.

For unit I: Sec 9,10,11,14,15,17,18,19,20,21

For unit II: Sec 65,66,68.

For unit III. Sec 31, 32, 35, 39, 40, 43

For unit IV: Sec 45, 47

For unit V: Sec 53, 54, 55, 56, 58, 59, 60.

Books for reference :

1. Complex Analysis – P.Duraipandian, Emerald Publishers.
2. Complex Analysis – S.Narayanan and T.K.Manicavachogam Pillai (S.Viswanathan publishers)

Elective Subjects

Major Elective

Title : Elementary Number Theory

Subject code :

Credits : 5

Hours : 6

Unit I: Divisibility, Congruences, Solution of Congruences.

Unit II: Chinese Remainder Theorem, Number Theory from an Algebraic view point, Groups, Rings and Fields.

Unit III: Quadratic Residues, Quadratic reciprocity, The Jacobi Symbol .

Unit IV: Greatest integer function, Arithmetic Functions. The Mobius Inversion formula.

Unit V: The equation $ax+by=c$, Simultaneous Linear Equations, Pythagorean Triplets, Assorted Examples (simple problems only).

Books for Reference:

1. An Introduction to the Theory of Numbers (V Edition) by Ivan Niven, Herbert S.Zuckarman and Hugh L.Montgomery-John Wiley and Sons.
2. David N. Burton, "Elementary Number Theory", 6th Edition, Tata McGraw Hill Publishers, 2008.
3. Kumaravelu. S and SusheelaKumaravelu – Elements of Number Theory, Nagarcovil, 2002.
4. Neville Robinns, Beginning Number Theory, 2nd Ed., Narosa Publishing House Pvt. Ltd., Delhi, 2007.

Major Elective

Title : Resource Management Techniques

Subject code :

Credits : 5

Hours : 6

Unit I: PERT and CPM – Project network diagram – critical path (crashing excluded) – PERT computations.

Unit II: Inventory models – basic concepts – EOQ Models – Uniform demand rate, infinite production rate with and without shortages. Uniform demand rate, finite production rate with and without shortages.

Unit III: Deterministic models with Price Breaks – Purchase inventory model: with one price break, with two price breaks and with any number of price breaks – classical news paper – boy problem with discrete demand.

Unit IV: Queuing Theory – basic concepts – steady state analysis of M/M/1 and M/M/C – systems with infinite and finite capacities.

Unit V: Sequencing Problems – n jobs through 2 machines – n jobs through 3 machines – two jobs through m machines - n jobs through m machines.

Books for Reference:

1. Resource Management Techniques : V.Sundaresan, K.S. Ganapathy Subramanian and K.Ganesan, A.R.Publications, Chennai.
2. KantiSwarup, P.K. Gupta and Manmohan - Operations Research - Sultan Chand & Sons – 2006, 12th edition.
3. Gupta.P.K.and D.S. Hira – Operations Research - S.Chand and Company.

Major Elective

Title : Programming language 'C' (Theory and Practicals)

Subject code :

Credits : 5

Hours : 6

Unit I: Introduction – Constants – Variables – Data types – Operators - Precedence of Operators – Library functions – Input statements – Output statements – Escape sequences – Formatted outputs – Storage classes – Command line arguments – Preprocessor directives.

Unit II: Control statements – IF statement – IF ELSE statement – Nested IF statement – Switch case statement – conditional operators – GO TO statement – WHILE statement - DO WHILE statement – FOR statement – Nested FOR, CONTINUE, EXIT, BREAK.

Unit III: Arrays – One dimensional arrays – Declaration – Initialization of arrays, two dimensional arrays. Multidimensional arrays.

Unit IV: Functions – Definition, Function declaration, Calling a function, Call by reference and call by value. Categories of functions – Nesting of functions – Recursion.

Unit V: Structures – Structure definition – structure initialization – Union – Enumerations – User defined data types – Files – open – close – input –output – Basic operations on files.

Content and Treatment as in :

Programming in 'C' – E.Balagurusamy, Tata McGraw Hill Publishers, NewDelhi.

Books for reference :

1. 1.Gottfred B.S : Programming with C , Schuam's series.
2. yashwant kanishkar : Let us C

Elective – Practicals

Writing 'C' programs for the following :

1. To convert centigrade to Fahrenheit.
2. To find the area, circumference of a circle.
3. To convert days to months and days.
4. To solve quadratic equations.
5. To find sum of n numbers.
6. To find the largest and smallest number.
7. To evaluate the sine series, cosine series.
8. To generate Pascal's triangle, Floyd's triangle.
9. To add and subtract two matrices.
10. To multiply two matrices.
11. To evaluate Fibonacci series using functions.
12. To evaluate compound Interest using functions.
13. To add complex numbers using functions .

Elective

Title : Numerical Methods

Subject code :

Credits : 5

Hours : 6

Unit I: Solution of Numerical Algebraic and Transcendental Equations: The bisection method – iteration method – Newton’s method – Regula-falsi method

Unit II: Solution of Simultaneous Linear Algebraic Equations: Gauss elimination method – Gauss Jordan method - Gauss Jacobi method – Gauss Seidal method.

Unit III: Interpolation with equal intervals: Newton's forward - backward interpolation formula - Gauss forward - backward interpolation formula - Bessel's formula (No derivations)-simple problems.

Unit IV: Interpolation with unequal intervals: Divided differences - Newton's divided difference formula - Lagrange's interpolation formula – Inverse Interpolation.

Unit V: Numerical Differentiation and Integration: Newton's forward and backward differences to compute derivatives - Derivatives using Bessel's formula - Trapezoidal rule - Simpson's 1/3 and 3/8 th rule (No derivations)-simple problems.

Books for Reference:

1. Venkataraman, M.K - Numerical Methods in Science and Engineering - National Publishing company, V Edition 1999.
2. Kandasamy, P. K. Thilagavathy, and K. Gunavathy - "Numerical Methods", S.Chand& Company Ltd., Edn. 2006.
3. Arumugam S., Isaac A. and Somasundaram, “Numerical analysis with Programming in C”, New Gamma Publishing House, Palayamkottai, 2015.

Major Elective
Title : Graph Theory
Subject code :
Credits : 5
Hours : 6

Unit I: Introduction, graphs & subgraphs, definition and examples. Degrees, subgraphs, isomorphism, independent sets and coverings, intersection graphs and line graphs, matrices.
(Chapter2: sec 2.1 to 2.8 omit 2.5)

Unit II : Degree sequences, graphic sequences – simple problems. Connectedness: Walks, trails and paths, connectedness and components. Blocks, connectivity.
(Chapters: 3 and 4)

Unit III : Eulerian and Hamiltonian Graphs, simple problems.
(Chapter 5)

Unit IV : Trees – introduction, characterization of trees, centre of a tree. (Chapter6)

Unit V : Planarity: introduction, definition and properties. Directed graphs: introduction, definition and basic properties – paths and connections – digraphs and matrices.
(Chapter 8 &10 omit 8.2, 8.3, 10.4)

Contents and Treatment as in :

“Invitation to graph theory “- S. Arumugam & S. Ramachandran

Books for reference:

1. A First Look at Graph Theory – John Clark – Allied Publishers.
2. Graph Theory – S. Kumaravelu and Susheela Kumaravelu.
3. A First Course in Graph Theory –S.A. Choudam – Macmillan India Ltd.

Major Elective

Title : Partial Differential Equations with Applications

Subject code :

Credits : 5

Hours : 6

Unit I: Basic concepts-Partial differential equations, Fourier series, solving PDE-using separation of variables simple problems.

Unit II: Partial differential equations – definition and examples, Transverse vibration of a string – solution of wave equation by separation of variables – displacement expressed in Fourier series.

Unit III: One dimensional heat flow – Heat equation and its solution. Two dimensional heat flow (steady state only).

Unit IV: Laplace equation in two dimensions and its solutions, temperature distribution in rectangular plates.

Unit V: Laplace's equation in polar coordinates and its solution. Temperature distribution in circular annulus.

Books for reference :

1. Advanced Calculus for Applications – F.B. Hilder Brandt.
2. Differential Equations – Diwan and Agshe.
3. Mathematics for Engineers and Physicists – Louis R Pes.
4. Mathematics for Engineers – Scko Quickaff.

Non – Major Elective Subjects

Non Major Elective

Title : Analytical Skills and Aptitude

Subject code :

Credits : 2

Hours : 2

Unit I: Arithmetical ability – problems in numbers, fractions, roots.

Unit II: Basic formulae and problems on simple interest, compound interest.

Unit III: Permutations and combinations, probabilities, simple problems

Unit IV: Odd man out and series.

Unit V: Data interpretation: Bar Graphs, Pie Charts.

Book for reference :

Quantitative Aptitude For Competitive Examinations – R.S. Agarwal

Non Major Elective

Title : Functional Mathematics

Subject code :

Credits : 2

Hours : 2

Unit I : Logic and arithmetical ability: Problems on ages, surds and indices.

Unit II : Basic formulae and problems on Profit and Loss, Ratio and Proportion.

Unit III : Basic formulae and problems on Time and Work, Time and Distance.

Unit IV : Basic formulae and problems on Trains, problems on Races and Games of Skill.

Unit V : Basic formulae and problems on stocks and shares.

Books for reference :

1. Quantitative Aptitude for Competitive Examinations – R.S.Agarwal.

Allied Subjects

Semester I

Allied Subject: Paper I (for B.Sc., Physics, Chemistry and Computer Science Students)

Title : Allied Mathematics - I

Subject code :

Credits : 5

Hours : 7

Unit I : Characteristic Equation–Eigen values and Eigen vectors– Cayley Hamilton Theorem (Statement only).

Unit II : Polynomial Equations–Imaginary and Irrational roots– Transformation of Equations– Reciprocal equations– simple problems.

Unit III: Differential Calculus – nth derivatives–Leibnitz theorem(without proof) and applications– Jacobians

Unit IV : Radius of Curvature in Cartesian and polar coordinates– Pedal equation of curve.

Unit V : Integral Calculus– Integration by parts– Definite integrals and its properties–Reduction formula –simple problems.

Recommended Text:

Allied Mathematics – P.R. Vittal (Margam Publications).

Books for reference :

1. Allied Mathematics Vol I – prof. P. Duraipandian and Dr. S. Udayabskaran, Muhil Publishers, Chennai.
2. Allied Mathematics – Dr. S.P. Rajagopalan and Dr. R. Sattanathan.

Semester II

Allied Subject: Paper II (for B.Sc., Physics, Chemistry & Computer Science Students)

Title : Allied Mathematics - II

Subject code :

Credits : 5

Hours : 7

Unit I: Fourier Series – Definition- To find the Fourier coefficients of periodic functions of period 2π .

Unit II: Second order differential equation with constant coefficient - particular integral of the type e^{ax} , $\cos ax$, $\sin ax$, $e^{ax} V$, where V is any function of $\cos ax$ or $\sin ax$ or x or x^2 .

Unit III: Laplace Transforms – Laplace transformation of standard functions and simple properties, Inverse Laplace Transforms, application to solution of linear differential equations with constant coefficients.

Unit IV: Vector Differentiation – Scalar Point functions, Vector Point functions, Gradient, Divergence, Curl, Directional derivatives, normal to a surface.

Unit V: Vector integration - Line, Surface and Volume integral – Gauss, Stoke's and Green's theorems.

Recommended Text:

Allied Mathematics – P.R. Vittal (Margam Publications).

Books for reference:

1. Allied Mathematics Vol II – P. Duraipandian and Dr. S. Udayabaskaran, Muhil Publishers, Chennai.
2. Allied Mathematics – Dr. S.P. Rajagopalan and Dr. R. Sattanathan.