MAHENDRA ARTS & SCIENCE COLLEGE

(AUTONOMOUS)

[Accredited by NAAC "A" Grade& Recognized under u/s 2(f) and 12B of the UGC act 1956]

KALIPPATTI-637501

DEGREE OF BACHELOR OF SCIENCE

CHOICE BASED CREDIT SYSTEM

SYLLABUS FOR B.Sc. MATHEMATICS

FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR

2016 – 2017 ONWARDS

B.Sc., DEGREE COURSE

(Semester System)

FACULTY OF SCIENCE **BRANCH - I: MATHEMATICS**

(Choice Based Credit System)

(For Periyar University Affiliated Colleges)

REGULATIONS AND SYLLABUS (with effect from 2016-2017 onwards)

1. **Objectives of the Course**

   Mathematics to-day is penetrating all fields of human endeavor and therefore it is necessary to prepare the students to cope with the advanced developments in various fields of Mathematics. The objectives of this course are the following:
   (a) To import knowledge in advanced concepts and applications in various fields of Mathematics.
   (b) To provide wide choice of elective subjects with updated and new areas in various branches of Mathematics to meet the needs of all students.

2. **Eligibility for Admission:**

   A Pass in the Higher Secondary Examination of TamilNadu Higher Secondary Board or some other Board accepted by the Syndicate as equivalent thereto with Mathematics (other than Business mathematics) as one of the subjects.

3. **Duration of the Course:**

   The course of study of Bachelor of Science in Mathematics shall consist of three academic years divided into six semesters with 142 credits. Each Semester consists of 90 working days.

4. **Course of Study:**

   The courses of study for the degree shall be in Branch I - Mathematics (Choice Based Credit System) with internal assessment according to syllabi prescribed from time to time. The **Internal Assessment** mark is distributed to 3 components viz**Tests, Assignment** and **Attendance** as **15**, **05**and **05** marks, respectively.
   Total Number of Marks : **3900**For Each Paper : **100** (Int. 25 + Ext. 75) .

5. **Examinations :**

   The theory of examination shall be of three hours duration for each paper at the end of each semester. The candidate failing in any subject(s) will be permitted to appear for each failed subject(s) in the subsequent examinations. The practical examinations for UG course shall be conducted at the end of the even semesters only.

S.No	Course Code	Subject	Periods	Exam Duration (Hrs)	Maximum Marks			Credit Points
					CA	CE	Total	
SEMESTER – I								
1	M16UFTA01	Tamil - I/ Hindi - I/ Telugu - I/ Malayalam – I	5	3	25	75	100	3
2	M16UFEN01	Foundation English - I	5	3	25	75	100	3
3	M16UMA01	Core 1: Classical Algebra and Trigonometry	6	3	25	75	100	5
4	M16UMA02	Core 2: Vector Calculus	5	3	25	75	100	4
5	M16UPHA01	Allied I: Physics – I	4	3	25	75	100	4
6	-	Allied Practical I : Physics	3	-	-	-	-	-
7	M16UVE01	Value Education: Yoga	2	3	25	75	100	2
		Total	30				600	21
SEMESTER – II								
8	M16UFTA02	Tamil - II/ Hindi - II/ Telugu - II/ Malayalam – II	5	3	25	75	100	3
9	M16UFEN02	Foundation English – II	5	3	25	75	100	3
10	M16UMA03	Core 3: Calculus	6	3	25	75	100	4
11	M16UMA04	Core 4: Analytical Geometry 2D And 3D	5	3	25	75	100	5
12	M16UPHA02	Allied II: Physics – II	4	3	25	75	100	4
13	M16UPHAP01	Allied Practical I: Physics	3	3	40	60	100	2
14	M16UES01	Value Education: Environmental Studies	2	3	25	75	100	2
		Total	30				700	23
SEMESTER – III								
15	M16UFTA03	Tamil - III/ Hindi - III/ Telugu - III/ Malayalam – III	5	3	25	75	100	3
16	M16UFEN03	Foundation English - III	5	3	25	75	100	3
17	M16UMA05	Core 5: Differential Equations and Laplace transforms	4	3	25	75	100	5
18	M16UMA06	Core 6: Mechanics-I	5	3	25	75	100	5
19	M16USTA02	Allied III: Mathematical Statistics	5	3	25	75	100	4
20	M16USTAP01	Allied Practical III: Statistics	2	-	-	-	-	-
21	M16UMAS01	SBEC:-I Aptitude Examination -I	2	3	25	75	100	2
22	M16UCSN02	NMEC-I	2	3	25	75	100	2
		Total	30				700	24

SEMESTER – IV								
23	M16UFTA04	Tamil - IV/ Hindi - IV/ Telugu - IV/ Malayalam – IV	5	3	25	75	100	3
24	M16UFEN04	Foundation English - IV	5	3	25	75	100	3
25	M16UMA07	Core 7: Mathematics for competitive Examinations	4	3	25	75	100	4
26	M16UMA08	Core 8: Mechanics-II	5	3	25	75	100	5
27	M16USTA09	Allied IV: Statistical Inference	5	3	25	75	100	4
28	M16USTAP01	Allied Practical II: Statistics	2	3	40	60	100	2
29	M16UMAS02	SBEC:-II Aptitude Examination -II	2	3	25	75	100	2
30	M16UCSN04	NMEC-II	2	3	25	75	100	2
		Total	30				800	25
SEMESTER – V								
31	M16UMA09	Core 9: Algebraic Structures–I	6	3	25	75	100	5
32	M16UMA10	Core 10: Real Analysis – I	6	3	25	75	100	4
33	M16UMA11	Core 11: Numerical Analysis	6	3	25	75	100	4
34		Elective (Group - A)	5	3	25	75	100	4
35	M16UMA12	Core 12: Operation Research –I	5	3	25	75	100	4
36	M16UMAS03	SBEC:-III Verbal Reasoning	2	3	25	75	100	2
		Total	30				600	23
SEMESTER – VI								
37	M16UMA13	Core 13: Algebraic Structures-II	6	3	25	75	100	5
38	M16UMA14	Core 14: Real Analysis – II	6	3	25	75	100	4
39	M16UMA15	Core 15: Complex Analysis	6	3	25	75	100	4
40		Elective (Group - B)	5	3	25	75	100	4
41	M16UMA16	Core 16: Operation Research -II	5	3	25	75	100	4
42	M16UMAS04	SBEC-IV Non - Verbal Reasoning	2	3	25	75	100	2
43	M16UMAPR1	Project	-	-	25	75	100	4
44	M16UEX01	Extension Activities	-	-	-	-	-	1
		Total	30				700	28
		Grand Total					4100	144

A) ALLIED SUBJECTS FOR B.Sc., MATHEMATICS

PHYSICS & STATISTICS

SEMESTER	SUBJECT	CODE
I	Allied Physics-I	M16UPHA01
II	Allied Physics-II	M16UPHA02
II	Allied Physics-Practical	M16UPHAP01
III	Allied Statistics-II	M16USTA02
IV	Allied Statistics-III	M16USTA03
IV	Allied Statistics-Practical	M16USTAP01

ALLIED MATHEMATICS FOR B.Sc. STATISTICS, PHYSICS & CHEMISTRY MAJOR STUDENTS

Semester - I	Paper I	**Allied Mathematics –I** Algebra, Integralcalculus And Fourier Series	M16UMAA01
Semester - II	Paper II	**Allied Mathematics –II** Differential Equations And Laplace transforms	M16UMAA02
Semester - II	Paper III	Allied Mathematics – **Practical**	M16UMAAP01

ALLIED MATHEMATICS FOR B.Sc., COMPUTER SCIENCE and B.C.A. Major Student

Semester - I	**Allied – I - Mathematics** Algebra , Differential Equations And Laplace Transforms	M16UMAA03

SEMESTER	ELECTIVE (GROUP – A)		
V	**S.No**	**Course Title**	**Course Code**
	1.	Discrete Mathematics	M16UMAE01
	2.	Elementary Number Theory	M16UMAE02
	3.	Astronomy	M16UMAE03
ELECTIVE (GROUP – B)			
VI	**S.No**	**Course Title**	**Course Code**
	1.	Mathematical Modeling	M16UMAE04
	2.	Graph Theory	M16UMAE05
	3.	Probability Theory	M16UMAE06

B) SKILL BASED ELECTIVE COURSES:

SEMESTER	COURSE	COURSE CODE
III	Aptitude Examination -I	M16UMAS01
IV	Aptitude Examination -II	M16UMAS02
V	Verbal Reasoning	M16UMAS03
VI	Non - Verbal Reasoning	M16UMAS04

C) NON - MAJOR ELECTIVE COURSES:

SEMESTER	NON-MAJOR ELECTIVE COURSE (GROUP – A)	
III	1. Competitive Examination – I	M16UMAN01
	2. Matrix Algebra	M16UMAN02
NON-MAJOR ELECTIVE COURSE (GROUP – B)		
IV	1. Competitive Examination – II	M16UMAN03
	2. Numerical Methods	M16UMAN04

D) VALUE ADDED COURSES:

SEMESTER	COURSE	COURSE CODE
III	Competitive Examination	M16UVA05
IV	Verbal and Logical Reasoning	M16UVA06

6. UNIFORMITY IN THE NUMBER OF UNITS IN EACH PAPER:

Each theory paper shall consist of five units. The Question paper shall consist of questions uniformly distributed among all the units. For theory paper without practicals, **Max marks is 75.**

7. A. QUESTION PAPER PATTERN FOR ALL UG COURSES WITHOUT PRACTICAL:

Time: Three Hours Maximum Marks: 75

Part A: (10 x 2 = 20)

Answer ALL Questions
(Two Questions from Each Unit)

Part B: (5 x 5 = 25)

Answer ALL Questions
(One Question From Each Unit with internal choice)

Part C: (3 x 10 = 30)

Answer Any Three Questions out of Five Questions
(One Question from Each Unit)

B. ALLIED MATHEMATICS FOR B.Sc. STATISTICS, PHYSICS & CHEMISTRY MAJOR STUDENTS– PRATICAL

QUESTION PATTERN

Answer any Three out of Five Questions(3x15 =45)

Practical - 45

Mark Allotment: 60 – External <

Record - 15

40 – Internal

8. PASSING MINIMUM:

The Candidates shall be declared to have passed the examination if the candidates secure not less than 30marksin the University examination in each theory paper without practical.

9. PROJECT

There shall be a Mainproject work at end of Semester VI as prescribed by the respective boards of studies,if applicable.

The following guidelines / clarifications are offered for the Project with Viva-voce:

1. The project should be valued for 75 marks by an external examiner; however the Viva-Voce examination should be conducted by both the external examiner appointed by the College and the internal examiner / guide/teacher concerned. The average of marks awarded in the viva-voce by both the external examiner and the internal examiner is to be intimated along with the marks obtained by the candidate in project evaluation, to the College.
2. The Project Report may consist a minimum of 60 pages.
3. The candidate has to submit the Project Report 30 days before the commencementof the VI Semester Examinations.
4. A candidate who fails in the Project/Dissertation or is absent may resubmitthe report, on the same topic, with necessary modification / correction /improvements in the subsequent even semester examination for evaluation andshall undergo viva-voce examination.

SEMESTER-I

Core - I	B.Sc. Mathematics	2016 - 2017
M16UMA01	CLASSICAL ALGEBRA AND TRIGONOMETRY	
Credit: 5		

Subject description:

This course focuses on the different typesof series, also discusses the standard methods of solving both polynomial and transcendental type equations.

Goal:

To enable the students to learn about the series and tofind the roots for the different types of the equation.

Objectives:

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

Unit I -

Definition of Matrix – Addition ,Subtraction , Multiplication of Matrices . Transpose of a Matrix – Adjoint of a Matrix – Inverse of the Matrix- Cayley – Hamilton theorem (statement only) and its problems –Diagonalisation of Matrices – problems.

Unit II

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

Unit III

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

Unit IV

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

Unit V

Expansions of sin nθ,Cosnθ and Tan nθ – Expansions of $\sin^n\theta$, $\cos^n\theta$ -Expansions of sinθ , cosθ and tanθ in terms of θ – Hyperbolic and inverse hyperbolic functions and their properties – Logarithm of a complex number – General principal values – problems.

Text Book:-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Algebra-Volume I	T.K.Manickavasagam Pillai and S. Narayanan.	Vijay Nicole Imprints Pvt, Ltd,#c-7,Nelson Manickam Road,Chennai-600029	2004
2.	Trigonometry	T.K.Manickavasagam Pillai and S. Narayanan	Vijay Nicole Imprints Pvt, Ltd,#c-7,Nelson Manickam Road, Chennai-600029	2004

Reference:

1.	Algebra,calculus and Trigonometry	Dr.P.R.Vittal.	Margham publications,24, Rameswaram Road, T.Nager, Chennai-600017.	2000

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Three Assignments can be given from the following topics

1. Cayley – Hamilton theorem
2. Diagonalisation of Matrices
3. Newton's Theorem

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Polynomial equations
2. Descarte's rule of signs

SEMESTER-I

Core - II	B.Sc. Mathematics	2016 - 2017
M16UMA02	VECTOR CALCULUS	
Credit: 4		

Subject Description :

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

Goals:

To enable the students to learn about the expansion of trigonometrical functions and to gain knowledge about vector treatment which will help them to deal the analytical geometry problems using vector method.

Objectives:

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

Vector Differentiation

Unit I

Vector differentiation: Limit of a vector function – continuity and derivative of vector function - Geometrical and Physical significance of vector differentiation - Partial derivative of vector function – gradient and directional derivative of scalar point functions – Equations of tangent plane and normal line to a level surface.

Unit II

Vector point function: Divergence and curl of a vector point function – solenoidal and irrational functions – physical interpretation of divergence and curl of a vector point function.

Unit III

Vector identities – Laplacian operator.

Vector Integration

Unit IV

Integration of vector functions – Line , surface and volume intergrals.

Unit V

Gauss - Divergence Theorem – Green'sTheorem – Stoke's Theorem (Statements only). Verification of theorems and simple problems using the theorems.

Text Book:

P. R. Vittal and V. Malini, Vector Analysis, Margham Publications, Chennai, 2006.
Unit I Chapter 1 - Page 1 - 20
Unit II Chapter 1 - Page 22 - 51
Unit III Chapter 2 - Page 54 - 72
Unit IV Chapter 2 - Page 75 - 106
Unit V Chapter 2 - Page 108 - 140

Reference(s)

1. T. K. ManickavasagamPillay and others , Vector Calculus, S. Viswanathan Publications.
2. S. Shanti Narayan, A Text Book of Vector Calculus, S. Chand and Co., New Delhi,1966.
3. K. Viswanatham& S. Selvaraj, Vector Analysis, Emerald Publishers, Chennai, Reprint 1999.
4. P. Duraipandian, LaxmiDuraipandian, Vector Analysis, Emerald Publishers, Chennai, Reprint 2003.

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Gauss - Divergence Theorem
2. Green'sTheorem

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Stoke's Theorem
2. Integration of vector functions

SEMESTER-II

Core - III	B.Sc. Mathematics	2016 - 2017
M16UMA03	CALCULUS	
Credit:4		

Subject description:

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

Goal:

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

Objectives:

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

UNIT I: Successive Differentiation

Definition and Notations – n^{th} derivatives – Standard forms – Partial fractions – Trigonometrical transformations – Leibnitz's theorem on the n^{th} derivatives – Problems.

UNIT II:

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

UNIT III:

Integration of f'(x)/f(x), f'(x)□f(x) ,(px + q)/√(ax2+bx+c)], [√(x-a)/(b-x)], [√(x-a)(b-x),1/[√(x-a)(b-x),1/(acosx + bsinx +c), 1/(acos2x+bsin2x+c), Integration by parts

UNIT IV:

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

UNITV:

Change of order of integration in double integral- Jacobions.- change of variables in double and triple integrals-Notion of improper integrals, their convergence, simple tests for convergence simple problems.

Text Books:

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

Reference:

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

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Integration problems
2. Reduction formula

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Leibnitz's theorem on the n^{th} derivatives
2. Radius of curvature

SEMESTER-II

Core - IV	B.Sc. Mathematics	2016 - 2017
M16UMA04	ANALYTICAL GEOMETRY 2D AND 3D	
Credit: 5		

Subject Description:

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

Goal:

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

Objectives:

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

UNIT I:

Analytical geometry of 2D - Straight line - Plane –Simple problems

UNIT II:

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

UNIT III:

Analytical Geometry 3D-stright.lines-coplanarity of straight-line-shortest distance (S.D) and equation of S.D between two lines-simple problems.

UNIT IV:

Sphere: standard equation of sphere-results based on the properties of a sphere-tangent plane to a sphere- equation of a circle.

UNIT V:

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

Text Book:

1. Analytical Geometry by P. DuraiPandian& others (unit I & II)
2. Solid Geometry by N.P. Bali- Laxmi Publications (P) Ltd (unit III,IV& V)

Reference:

1. Analytical Geometry of 2D by T.K. M. Pillai and Others – Visvanathan Publications

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Straight line problems
2. Plane problems
3. Sphere problems

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Cone problems
2. Cylinder problems

SEMESTER-III

Core - V	B.Sc. Mathematics	2016 - 2017
M16UMA05	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	
Credit: 5		

Subject Descriptions:

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

Goals:

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

Objectives:

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

Differential Equations

Unit I

Differential Equations - Linear differential equations with constant co-efficients – The operators D and D^{-1} – Particular Integral – Special methods of finding particular integral – Linear equations with variable co-efficients – To find the particular integral – Special method of evaluating the particular integral when x is of the form x^m.

Unit II

Exact differential equations – conditions of integrability of Mdx + Ndy = 0 – Practical rule for solving an exact differential equation – Rules for finding integrating factors – equations of the first order but of higher degree – Solvable for x, y, dy/dx – Clairaut's form – equations that do not contain x explicitly - Equations that do not contain y explicitly- Equations homogeneous in x & y.

Unit III

Partial differential equations - Derivation of partial differential equations by elimination of constants, arbitrary functions – Different Integrals of P.D.E. – Solutions of P.D.E. in some simple cases- Standard types of first order equations – Standard I, II, III, IV - Equations reducible to the standard forms - Lagrange's equation.

Laplace Transforms

Unit IV

The Laplace Transforms – Sufficient conditions for the existence of the Laplace Transforms – Laplace Transforms of periodic functions – General theorems – Evaluation of certain integrals using Laplace Transforms.

Unit V

The inverse transforms – Inverse transforms of functions – Method of partial fractions – Application of Laplace Transforms to solve ordinary differential equations.

Text Book:

S. Narayanan & T. K. ManickavasagamPillay, Calculus Volume III, S. Viswanathan Pvt. Ltd., 2008
Unit I Chapter 2 § 1, 1.2, 2, 3, 4, 8, 8.1,8.2,8.3
Unit II Chapter 1 § 3.1 – 3.3, 4, 5, 5.1 – 5.5, 6.1, 7.1 - 7.3
Unit III Chapter 4 § 1, 2, 2.1, 2.2, 3, 4, 5, 5.1 – 5.5, 6
Unit IV Chapter 5 § 1, 1.1, 1.2, 2, 3.4, 5
Unit V Chapter 5 § 6, 7, 8, 9

References:

1. P. R. Vittal, Differential Equations and Laplace Transforms, Margham Publications, 2004.
2. S. Sudha, Differential Equations and Integral Transforms, Emerald Publishers, 2003

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Second order differential equations.
   Type I , II & III
2. Clairaut's form

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Properties of Laplace transforms
2. Partial differential equation Type I,II,III & IV

SEMESTER-III

Core -VI	B.Sc. Mathematics	2016 - 2017
M16UMA06	MECHANICS - I	
Credit: 5		

Objective:

The purpose of this course is to learn and understand principles of mechanics. Topics include: Forces- Parallelogram, Triangle, Co-planar, Moments and frictions. And also is to provide the students the necessary analytical skills to solve the variety of mechanics equations and related problems.

Learning Outcomes:

Students who successfully complete the course will demonstrate the following outcomes by tests and homework.

1. An ability to identify the mechanical systems, Force , Friction, Moment and momentum.
2. An ability to predict the Forces, Coplanar Forces and Frictions.

UNIT I

Forces acting at a point - Parallelogram of forces – Triangle of forces – Lami's Theorem – Extended form of the parallelogram of law of forces – #Resultant of any number of coplanar forces acting at a point#.

UNIT II

Resultant of two like and unlike parallel forces acting on a rigid body – Moments of a force – Varignon's Theorem of moments – Couple – Equilibrium of two couples.

UNIT III

Equilibrium of three forces acting on a rigid body – Three coplanar forces – Two trigonometrical theorems – Coplanar forces – Reduction of any number of coplanar forces – Conditions for a system of forces to reduce to a single force or to a couple – Equation to the line of action of the resultant.

UNIT IV

Friction – Laws of friction – Co-efficient of friction, angle and cone of friction – Equilibrium of a particle on a rough inclined plane under any forces – Problems on friction.

UNIT V

Uniform string under the action of gravity - Equilibrium of strings and chain under gravity – Equation of common catenary – #Tension at any point# – Geometrical properties of the common catenaries – Problems.

Text Book:

M.K. Venkatraman, Statics, Agasthiar Publication (1999).

UNIT I Chapter 2 Sections 3 - 5, 9, 10 and 15
UNIT II Chapter 3 Sections 1 - 4, 7, 8, 12 and Chapter 4 Sections 1, 2
UNIT III Chapter 5 Sections 1, 2, 5 and Chapter 6 Sections 1, 2, 3, 5 and 8
UNIT IV Chapter 7 Sections 1 - 8, 10 and 13
UNIT V Chapter 11 Sections 1 - 6

Books for Reference:

1. A.V. Dharmapadam, Statics, S.Viswanathan Printers & Publishers Pvt. Ltd. (2009).
2. P. Duraipandian, LaxmiDuraipandian, MuthamizhJayapragasam, Mechanics, S. Chand & Company Ltd. (2010).

Additional web resources:

1. en.wikipedia.org/wiki/, 2. mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

- Lami's Theorem
- Varignon's Theorem of moments

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

- The Mechanical System
- Laws of friction

SEMESTER-III

Skill Based Elective Course - I

SBEC - I	B.Sc. Mathematics	2016 - 2017
M16UMAS01	**Aptitude Examination -I**	
Credit: 2		

Objective:

To enable the students to appear competitive examinations confidently.

UNIT I

Problems on numbers,Problems on Ages.

UNIT II

Surds & Indices, Profit & Loss.

UNIT III

Time & Work, Pipes& Cistern, Time & Distance.

UNIT IV

Problems on Trains, Boats& Streams, Allegation or Mixture.

UNIT V

Simple Interest, Compound Interest

Text Book:

R.S. Aggarwal, Quantitative Aptitude, S. Chand & Company Ltd. (2007).

Reference:

1. R.S. Aggarwal, Arithmetic (Subjective and Objective) For Competitive Examinations, S. Chand and Company Ltd. (2004).

2. R.S. Aggarwal, Objective Arithmetic, S. Chand & Company Ltd. (2004).

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1.Problems on numbers,
2. Problems on Ages.

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

- Simple Interest, Compound Interests
- Time & Work, Pipes & Cistern

SEMESTER-IV

Core - VII	B.Sc. Mathematics	2016 - 2017
M16UMA07	MATHEMATICS FOR COMPETITIVE EXAMINATIONS	
Credit: 4		

Objective:
To enable the students to appear competitive examinations confidently.

UNIT I

Numbers: Problems on Addition, Subtraction, Multiplication and Division (Shortcut Methods) – Various tests for Divisibility – Prime and Composite numbers – #Various types of numbers#.

UNIT II

HCF and LCM of numbers - Decimal fractions: Addition, Subtraction, Multiplication and Division of Decimal fractions - #H.C.F and L.C.M of Decimals# – Rule for converting Pure and Mixed Recurring Decimals into a Vulgar Fractions.

UNIT III

Simplification - Square Root- Square Root by means of Factors – General Method – Square Root of Decimal Fractions - Square Root of Vulgar Fractions - #Cube Root#.

UNIT IV

Percentage: Shortcut Method – Problems based on Population, #Average#, Ratio and Proportion.

UNIT V

Partnership, Chain rule - Direct proportion – Indirect Proportion.**# # Self-study portion.**

Text Book:
R.S. Aggarwal, Quantitative Aptitude, S. Chand & Company Ltd. (2007).

Reference:
1. R.S. Aggarwal, Arithmetic (Subjective and Objective) For Competitive Examinations, S. Chand and Company Ltd. (2004).
2. R.S. Aggarwal, Objective Arithmetic, S. Chand & Company Ltd. (2004).

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

- Decimal fractions: Addition, Subtraction, Multiplication
- Square Root by means of Factors

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

- Square Root of Vulgar Fractions
- Percentage: Shortcut Method

SEMESTER-IV

Core -VIII	B.Sc. Mathematics	2016 - 2017
M16UMA08	MECHANICS – II	
Credit: 5		

Subject Description:

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

Goal:

To enable the students to apply Laws, Principles, Postulates governing the Mechanics in physical reality.

Objectives:

End of this course, the student understand the reason for dynamic changes in the body.

UNIT I

Kinematics - Speed, Displacement - Velocity – Composition of velocities - Triangle of velocities - Relative velocity – Angular velocity - Relative angular velocities – Accelerations – Motion in a straight line under uniform acceleration – Simple problems.

UNIT II

Projectiles – Path of the projectile is a parabola – Characteristics of the motion of a projectile – Velocity of the projectile in magnitude and direction at the end of time – Range on an inclined Plane – Simple problems.

UNIT III

Collision of elastic bodies – Newton's experimental law – Impact of a smooth sphere on a fixed smooth plane – Direct impact of two smooth spheres – Loss of Kinetic Energy - Oblique impact of two smooth spheres and loss of Kinetic Energy – Simple problems.

UNIT IV

Simple harmonic motion - Simple harmonic motion in a straight line – General solution of a simple harmonic motion – Composition of two simple harmonic motions of the same period and in the same straight line – Composition of simple harmonic motions of the same period in two perpendicular directions – Simple problems.

UNIT V

Motion under the action of central forces – Velocity and acceleration in polar coordinates – Differential equation of central orbits – Pedal equation of the central orbit – Law of the inverse square – Simple problems.

Text Book:

M. K. Venkatraman, A Text Book of Dynamics, Agasthiar Publications (1970).

UNIT I Chapter III Sections 3.1 to 3.4, 3.7, 3.10, 3.11, 3.15, 3.17 and 3.22
UNIT II Chapter IV Sections 6.2, 6.4, 6.5, 6.9 and 6.12
UNIT III Chapter VIII Sections 8.3 - 8.8
UNIT IV Chapter X Sections 10.2, 10.3, 10.6 and 10.7
UNIT V Chapter XI Sections 11.2, 11.4, 11.6, 11.8

Books for reference:

1. M.L. Khanna, Dynamics, Jai PrakashNath and Company, Meerut, Tenth Edition (1975).
2. K. VisvanathaNaik and M.S. Kasi, Dynamics, Emerald Publishers, Chennai, (1992).

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Projectiles
2. Impact of a particle on a surface.

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Simple harmonic motion
2. Impact of a particle on a surface

SEMESTER-IV

Skill Based Elective Course – II

SBEC- II	B.Sc. Mathematics	2016 - 2017
M16UMAS02	**Aptitude Examination -II**	
Credit:2		

Objective:
To enablethe studentsto appear competitive examinations confidently

UNIT I

Logarithms, Races & Games of skill

UNIT II

Area, Volume& Surface Areas

UNIT III

Calendar, Clocks, Stocks & Shares

UNIT IV

Permutations & Combinations, Probability

UNIT V

Banker's Discount, Heights & Distance, Odd Man out & Series

Text Book:
R.S. Aggarwal, Quantitative Aptitude, S. Chand & Company Ltd. (2007).

Reference:

1. R.S. Aggarwal, Arithmetic (Subjective and Objective) For Competitive Examinations, S. Chand and Company Ltd. (2004).

2. R.S. Aggarwal, Objective Arithmetic, S. Chand & Company Ltd. (2004).

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2. mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Area, Volume .

,

2. Surface Areas

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

- Surface AreasTime
- Work, Pipes & Cistern

SEMESTER-V

Core - IX	B.Sc. Mathematics	2016 - 2017
M16UMA09	ALGEBRAIC STRUCTURES – I	
Credit: 5		

Subject description:

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

Goals:

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

Objective:

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

Unit I

Group – Definition – Examples – Some Preliminary lemmas – Problems – Subgroups – definition – lemmas – cosets – definition – theorems – Lagrange's Theorem – order of an element – Euler Theorem – Fermat Theorem. (Sections 2.1 to 2.4).

Unit II

A Counting Principle – Normal Sub Groups – Definition – Properties – Problems – Quotient groups – Definitions – Lemma. (Sections 2.5 and 2.6).

Unit III

Homomorphism – Definition – Examples - Lemmas - Kernal of a homomorphism – Fundamental theorem – Automorphism – Definition – Inner Automorphism – Lemmas – Examples – Cayley's Theorem. (Sections 2.7 – 2.9 excluding application 1 & 2).

Unit IV

Ring – Definition – Examples – some special classes of Rings – Zero Divisor – Integral Domain - Field - Definition –Examples-Ideals – Quotient Rings – Maximal ideal.(sections 3.1 , 3.2 , 3.4 & 3.5).

Unit V

The Field of Quotient of an Integral Domain – Euclidean Rings – Definition –Principal ideal Ring – Greatest common divisor – Properties – Unique factorization theorem (sections 3.6 & 3.7).

Text Books:

S.NO	Title of the Book	Author	Publishing Company	Year of Publication
1.	Topics in Algebra	I.N.Herstein.	John Wiley, Newyork.	1975

References:

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	A first course in modern algebra	A.R.Vasistha	Krishna PrekasanMandhir, 9, Shivaji Road, Meerut(UP)	1983
2.	Modern Algebra	M.L.Santiago	Tata McGraw Hill ,New Delhi.	1994
3.	Modern Algebra	K.ViswanathaNaik	Emerald Publishers, 135, Anna Salai, Chennai.	1988

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Homomorphism
2. Quotient Rings

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1.Euclidean Rings

2.Unique factorization theorem

SEMESTER-V

Core - X	B.Sc. Mathematics	2016 - 2017
M16UMA10	REAL ANALYSIS – I	
Credit: 4		

Subject Description:

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

Goal:

To introduce the concepts which provide a strong base to understand and analysismathematics.

Objective:

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

Unit I

Functions – Real Valued functions – Equivalence – Countablity – Real Numbers – Least upper bounds. (Sections 1.3 to 1.7) Sequence of real numbers – Definition of sequence and subsequence – Limit of a sequence – Convergent sequences – Divergent Sequences. (Section 2.1 to 2.4)

Unit II

Bounded sequences – Monotonic sequences – operations on convergent sequences – operations on Divergent sequences – Limit superior and limit inferior – Cauchy sequences. (Section 2.5 to 2.10)

Unit III

Series of real numbers – convergence and divergence – series with non negative terms – alternating series – conditional convergence and absolute convergence – Rearrangement of series – Test for absolute convergence – series whose terms form a non increasing sequence. (Sections 3.1 to 3.7)

Unit IV

Limits and Metric spaces – limit of a function on the real line – metric spaces limits in metric spaces (sections 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 – Discontinuous functions on R_1. (Sections 5.1 to 5.6)

Text Books:

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Methods of Real Analysis	Richard R. Goldberg .	Oxford &IBH Publishing Co.Pvt.Ltd.	1970

References:

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	A First course in Real Analysis .	Sterling K .Barberian.	Springer (India) Private Limited, New Delhi.	2004
2.	Mathematical Analysis	Tom M. Apostel	Narosa Publications, NewDelhi	2002
3.	Real Analysis	M.S.Rangachari	New Century Book House, chennai.	1996

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Sequence of real numbers
2. Test for absolute convergence

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Limits and Metric spaces
2. Continuous functions on metric spaces

SEMESTER-V

Core -XI	B.Sc. Mathematics	2016 - 2017
M16UMA11	NUMERICAL ANALYSIS	
Credit: 4		

Subject Description:

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

Goal:

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

Objective:

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

Unit I

Introduction to numerical analysis-The solution of algebraic and transcendental equations – Bisection method – Iteration method – Regular Falsi method, Newton-Raphson method.

Unit II

Solution of simultaneous linear algebraic equations – Direct methods – Gauss elimination method – Gauss-Jordan method – Iterative methods – Jacobi method – Gauss-Seidal method.

Unit III

Finite differences – Differences of a polynomial - Factorial polynomial - Interpolation for equal intervals – Gregory-Newton interpolation formulae – Interpolation with unequal intervals – Lagrange's interpolation formula – Inverse interpolation.

Unit IV

Numerical differentiation and integration – Newton's formulae to compute the derivative – Numerical integration – A general quadrature formula – Trapezoidal rule - Simpson's one third rule – Simpson's three-eighth rule.

Unit V

Numerical solution of ordinary differential equation – Taylor series method – Euler's method – Runge- Kutta methods-2^{nd} Order- Runge- Kutta methods-3^{rd} Order – Runge- Kutta methods-4^{th} Order -Predictor corrector methods.

Text Book:

P.Kandasamy, KThilagavathy, K.Gunavathy, Numerical Methods, S.Chand& Company limited, New
Delhi, Reprint 2009.
Unit I Chapter 3 § 3.1, 3.1.1, 3.2, 3.2.1, 3.2.2, 3.3, 3.3.1, 3.4, 3.4.1, 3.4.3, 3.4.4
Unit IIChapter 4 § 4.1, 4.2, 4.2.1, 4.7, 4.8, 4.9
Unit III Chapter 5 § 5.1, 5.2, 5.3, 5.4,
Chapter 6 § 6.1, 6.2, 6.3,
Chapter 8 § 8.7, 8.8

Unit IV Chapter 9 § 9.1, 9.2, 9.3, 9.7, 9.8, 9.9, 9.10, 9.13, 9.14
Unit VChapter 11 § 11.5, 11.9, 11.12, 11.13, 11.16, 11.17

Reference(s)

1. S. S. Sastry, Introducing methods of Numerical analysis, Prentice Hall of India private limited, New Delhi, 3rd Edition 2002.
2. M. K. Venkataraman, Numerical methods in Science and Engineering, 2004

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Regular Falsi method
2. Bisection method

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Trapezoidal rule
2. Runge- Kutta methods-2^{nd}& 3^{rd}Order

SEMESTER-V

Core -XII	B.Sc. Mathematics	2016 - 2017
M16UMA12	OPERATION RESEARCH - I	
Credit: 4		

Subject description:

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

1.

Goal:

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

Objectives:

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

Unit I:

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

Unit II:

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

Unit III:

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

Unit IV

Introduction – Balanced and unbalanced T.P , Feasible solution – Basic feasible solution – Optimum solution – Degeneracy in a T.P. – Mathematical formulation – North – West Corner rule – Vogell's approximation method (unit penalty method) - Method of Matrix minima (Least cost Method) – problems – Algorithm of Optimality test (Modi Method) – Problems .

Unit V

Assignment problem – Definition – Mathematical formulation of the Assignment problem – Test for optimality by using Hungarian method - Unbalanced Assignment problem – Degeneracy in Assignment problem - Maximization case in Assignment problem – Restrictions on Assignment problem – Travelling salesman problem –problems .

Text Book:

S.No	Name of the Book	Author	Publishing Company	Year of Publication
1.	Operations Research 9th Edition	P.K.Gupta ,Manmohan and KantiSwarup	Sultan Chand &Sons,Chennai .	2001

References:

1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi

2. Operations Research Principles and Problems: S. DharaniVenkata Krishnan, Keerthi publishing house PVT Ltd.

3. Problems in OR. P.K.Gupta ,Manmohan and KantiSwarup

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. L.P.P – Graphical solutions of L.P.P.
2. CharnesPenality Method
3. Assignment problem

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Duality and Simplex Method
2. Algorithm of Optimality test (Modi Method)

SEMESTER-V

Skill Based Elective Course III

SBEC - III	B.Sc. Mathematics	2016 - 2017
M16UMAS03	VERBAL REASONING	
Credit: 2		

Subject Description:

This paper presents the importance of Bank, TNPSC, RRB examinations.

Goals:

To enable the students to learn about the basic problems and logical reasoning and various concepts of Verbal Reasoning.

Objectives:

On successful completion of the course the students should have: Learnt the various concept of reasoning. Learnt the decision making statements and to solve the problems based on it

Unit I

Series Completion - Coding Decoding.

Unit II

Blood Relations –Direction Sense Test.

Unit III

Logical Venn-Diagrams – Mathematical Operations.

Unit IV

Logical Sequence of Words – Inserting the Missing Character.

Unit V

Assertion and Reason – Verification of Truth of the Statement.

Text Books:

S.No	Name of the Book	Author	Publishing Company	Year Of Publications
1.	Verbal and Non-Verbal Reasoning	R.S.AggarWal	S.Chand Co Ltd ,152 ,Annasalai ,Chennai.	2001

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Blood Relations
2. Assertion and Reason

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Direction Sense Test
2. Verification of Truth of the Statement

SEMESTER-VI

Core - XIII	B.Sc. Mathematics	2016 - 2017
M16UMA13	ALGEBRAIC STRUCTURES -II	
Credit: 5		

Subject description:

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

Goals:

To enable the students to understand the concepts of vector spaces and Dimension of vector spaces. Also the Inner product spaces,orthogonalization process and trace and transpose..

Objective:

On successful completion of course the students should have concrete knowledge about the abstract thinking like Inner product spaces,orthogonalization process by proving theorems.

Unit I

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

Unit II

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

Unit III

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

Unit IV

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

Unit V

Trace and Transpose – Definitions, Properties – Theorems – Determinants – Definitions – Properties – Theorems – Cramer's Rule – Problems.(Sections 6.8 and 6.9)

Text Books :

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Topics in Algebra- 2nd Edition	I.N.Herstein	John Wiely, NewYork	1975

Reference:

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	A first course in modern algebra	A.R.Vasistha	Krishna PrakasanMandhir, 9, Shivaji Road, Meerut (UP)	1983
2.	Modern Algebra	ViswanathaNaik	Emerald Publishers, 135, Anna Salai, Chennai –2.	2001

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1.Dimension of a Vector space

2.Canonical forms

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Triangular forms
2. Orthonormal & Orthonormal Basis

SEMESTER-VI

Core -XIV	B.Sc. Mathematics	2016 - 2017
M16UMA14	REAL ANALYSIS - II	
Credit: 4		

Subject Description:

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

Goal:

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

Objective:

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

Unit I

More about open sets – Connected sets – Bounded sets - Totally bounded sets –Complete metric spaces. (Sections 6.1 to 6.4)

Unit II

Compact metric spaces – Continuous functions on Compact Metric spaces – Continuity of the inverse functions – uniform continuity .(Section 6.5 – 6.8).

Unit III

Sets of measure zero- Definition of the Riemann integral – Existence of Riemann integrals – properties of Riemann integrals – derivatives (Section 7.1 to 7.5)

Unit IV

Roll's theorem – Law of Mean – Fundamental theorem of calculus – Improper integrals – Improper integrals (Continued) (Section 7.6 to7.10).

Unit V

Pointwise convergence of sequence of functions – uniform convergence of sequence of functions – consequences of uniform convergences – convergence and uniform convergence of series of functions (Section 9.1 to 9.4)

Text Books:

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Methods of Real Analysis.	Richard R. Goldberg.	IBM Publishing New Delhi.	1970.

Reference Books:

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	A First course in Real Analysis .	Sterling K .Barberian.	Springer (India) Private Limited, New Delhi.	2004
2.	Mathematical Analysis	Tom M. Apostel	Narosa Publications, NewDelhi	2002
3.	Real Analysis	M.S.Rangachari	New Century Book House, Chennai.	1996

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Compact metric spaces
2. properties of Riemann integrals

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Fundamental theorem of calculus
2. uniform convergence of sequence

SEMESTER-VI

Core - XV	B.Sc. Mathematics	2016 - 2017
M16UMA15	COMPLEX ANALYSIS	
Credit: 4		

Subject Description:

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

Goal:

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

Objectives:

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

Unit I

Functions of a complex variable – Limit of a function at a point – Theorems on limits – continuity – Derivatives – Cauchy – Riemann equations – Necessary and sufficient conditions – Analytic function – Examples - Harmonic Function – Properties –To find an analytic function whose real or imaginary part is given.- problems.

Unit II

Bilinear transformations - Definition - Properties – Invariance of cross ratio –Fixed points – problems – Special bilinear transformations - problems – Taylor's series – Laurent's series – problems.

Unit III

Simply connected domain – Cauchy's fundamental theorem – proof using Goursat's lemma – Cauchy's theorem for multiply connected domains – Cauchy's integral formula & Cauchy's formula for the first derivative – Morera's theorem - problems.

Unit IV

Cauchy's Inequality – Liouville's theorem - Fundamental Theorem of Algebra –Maximum modulus theorem – Singularities – Types of singularities – Isolated singularity – Removable Singularity - Pole - Essential singularity – Determination of the nature of singularity.

Unit V

Residue –Definition – Calculation of residues – Cauchy's residue theorem – Contour Integration - Integration around unit circle - Integration along the real axis – Jordan lemma (statement only) - Integration of functions with poles on the real axis - Problems

Text Book

1.	Complex Analysis	P.Duraipandian &LaxmiDuraipandian, D.Muhilan	Emerald Publishers, 135, Anna Salai, Chennai – 600 002	1988

References

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Theory and Problems of complex analysis	Murray	Schuam Outline Series	1986
2.	Complex Variables and Applications	Ruel V Churchill	McGraw Hill International Book Company, Newyork.	1986
3	Complex Variable Theory and Application	Kasana	PHI P.Ltd.,	2010

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Cauchy – Riemann equations
2. Necessary and sufficient conditions
3. Analytic function

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Cauchy's Inequality
2. Fundamental Theorem of Algebra
3. Singularities

SEMESTER-VI

Core - XVI	B.Sc. Mathematics	2016 - 2017
M16UMA16	OPERATION RESEARCH –II	
Credit: 4		

Subject Description:

This course gives emphasis to enhance student knowledge in game theory, performance measures of queues, optimal use of Inventory and Network scheduling with application.

Unit - I

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

Unit - II

Definitions - Newspaper boy problem - Discrete and continuous type cases – problems – Inventory model with one and two price break – problems.

Unit III

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

Unit IV

Introduction – Definition of network, event, activity, optimistic time, pessimistic time, the most likely time, critical path, total float and free float – Difference between slack and float – Phases of critical path in a PERT network – difference between CPM and PERT – Problems.

Unit V

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

Text Book:

S.No	Name of the Book	Author	Publishing Company	Year of Publication
1.	Operations Research 9th Edition	P.K.Gupta ,Manmohan and KantiSwarup	Sultan Chand &Sons,Chennai .	2001

Reference Books :

S.No	Name of the Book	Author	Publishing Company	Year of Publication
1.	Operations Research 2nd Edition	S.Kalavathy	Publishing House PvtLtd,New Delhi	2002
2.	Operations Research 2nd Edition	P.K.Gupta and D.S.Hira	S.Chand&Co ,New Delhi.	1986

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Three Assignments can be given from the following topics

1. Newspaper boy problem
2. Discrete and continuous type

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. PERT network
2. Domination Property

SEMESTER-VI

Skill Based Elective Course IV

SBEC - IV	B.Sc. Mathematics	2016 - 2017
M16UMAS04	NON-VERBAL REASONING	
Credit: 2		

Subject Description:

This paper presents the importance of Bank, TNPSC, RRB examinations.

Goals:

To enable the students to learn about the basic problems and logical reasoning and various concepts of Non-Verbal Reasoning.

Objectives:

On successful completion of the course the students should have: Learnt the various concept of reasoning. Learnt the decision making statements and to solve the problems based on it

Unit I

Classification–Analytical reasoning.

Unit II

Analogy.

Unit III

Mirror images–Water images .

Unit IV

Completion of incomplete pattern.

Unit V

Cubes and Dice – Dot situation.

Text Books:

S.No	Name of the Book	Author	Publishing Company	Year Of Publications
1.	Verbal and Non-Verbal Reasoning	R.S.AggarWal	S.Chand Co Ltd ,152 ,Annasalai ,Chennai.	2001

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Analogy.
2. Mirror images – Water images

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Completion of incomplete pattern
2. Completion of incomplete pattern

SEMESTER-V

Elective - I	B.Sc. Mathematics	2016 - 2017
M16UMAE01	DISCRETE MATHEMATICS	
Credit: 4		

Unit I

Mathematical Logic – Statements and Notations – Connectives – Negation -conjunction – Disjunction-Statement Formulas and Truth Table – Conditional and Biconditional – Well formed Formulas – Tautologies.
(sections 1.1 , 1.2.1 – 1.2.4 , 1.2.6 –1.2.8).

Unit II

Normal Forms – Disjunctive Normal Forms – Conjunctive Normal Forms -Principal Disjunctive Normal Forms – Principal Conjunctive Normal Forms - Ordering and Uniqueness of Normal Forms – The Theory of Inference for the Statement Calculus –Validity using Truth tables - Rules oInference - Consistency of premises and indirect method of proof .
(sections 1.3.1 - 1.3.5 , 1.4.1 – 1.4.3).

Unit III

Relations &ordering – Relations – Properties of binary relation in a set -Functions – Definition & Introduction – Composition of Functions – Inverse function –Binary and n - array operations – Hashing Functions – Natural numbers – Peano Axioms &Mathematical Induction – Cardinality .

Unit IV

Algebraic systems – Definition & Examples – Semi groups and monoids –definition and examples – homomorphism of semi groups &monoids – sub semi groups & sub monoids – Grammars – Formal Definition of a Language – Notions of Syntax Analysis.
(Sections 3.1.1, 3.1.2 , 3.2.1 , 3.2.2 , 3.2.3 , 3.3 , 3.3.2 , 3.3.3).

Unit V

Lattices as partially ordered Sets: Definition and Examples – some properties of Lattices – Lattices as Algebraic systems – sub Lattices – Direct product and homomorphism. Boolean Algebra: Definition and Examples – subalgebra , Direct product and homomorphism – Boolean Functions – Boolean Forms and Free Boolean Algebras - Values of Boolean Expression and Boolean Functions
(sections 4.1.1 , 4.1.2 , 4.1.3 , 4.1.4 , 4.2.1 , 4.2.2 , 4.3.1 , 4.3.2).

Text Books:

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Discrete mathematical structures with applications to computer science	J.P.Trembly, R.Manohar	Tata McGraw Hill, NewDelhi	2001

Reference Books:-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Discrete Mathematics	Prof.V.Sundaresan, K.S.GanapathySubramaniyan, K.Ganesan	Tata McGraw Hill, New Delhi	2000
2.	Discrete Mathematics	L.Lovarz, J.Pelikan, K.Vexztergombi	Springer International Edition	2002
3.	Discrete Mathematics	N. Chandrasekaran M. Uma parvathi	PHI Learning P. Ltd.	2010

SEMESTER-V

Elective - II	B.Sc. Mathematics	2016 - 2017
M16UMAE02	ELEMENTARY NUMBER THEORY	
Credit: 4		

Unit I

Absolute value-Divisibility of integers-Division algorithms-Greatest common divisor-Euclidean algorithm- Least common multiple.

Unit II

Prime and Composite numbers-The sieve of Eratosthenes-Euclid's theorem-Unique factorization theorem-positional representation of an integer-Divisors of an integer-Arithmetic functions-product of divisors.

Unit III

Perfect numbers-Euclid's theorem-Abundant, deficient and amicable numbers-Triangular number-Euler function-Greatest integer functions.

Unit IV

Congruences-Residues-Residue classes-complete residue system-Reduced residue system-Magic number-Divisibility tests-linear congruence.

Unit V

Introduction-Fermat's theorem-Euler's Extension of Fermat's theorem-Wilson's theorem-Lagrange's theorem.

Text Book:

S. Kumaravelu and SusheelaKumaravelu , Elements of Number theory, Nagarcoil, January 2002.
Unit I Chapter 2 Section 53 - 57
Chapter 3 Section61 - 76
Unit IIChapter 4 Section77 - 97
Unit III Chapter 4 Section98 - 113
Unit IV Chapter 6 Section155 - 188
Unit V Chapter 7 Section191 - 211

Reference(s)

1. David M.Burton, Elementary Number Theory.
2. Ivan Niven and H. Zuckerman, An Introduction to Theory of Numbers.

SEMESTER V

Elective - III	B.Sc. Mathematics	2016 - 2017
M16UMAE03	ASTRONOMY	
Credit: 4		

Unit I

Standard formulae in Spherical Trigonometry – Statements only – Celestial sphere – Celestial co-ordinates and their conversions – Diurnal motion - Problems connected with Diurnal Motion - Zones of Earth - Dip – Twilight – Problems.

Unit II

Astronomical Refraction – Tangent and Cassini's formulae – Geocentric parallax – Heliocentric parallax – problems.

Unit III

Kepler's laws of planetary motion – Newton's deductions from Kepler's Laws -Equation of Time – Seasons – Calender – Conversion of time – problems.

Unit IV

Fixing the Ecliptic – Fixing the position of the First point of Aries (Flamsteed's method) - The Moon – Different phases - Metonic cycle – Tides – problems .

Unit V

Eclipses – solar eclipses - Lunar eclipses – General description of solar system and Stellar universe – problems.

Text Books:

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Astronomy	Kumaravelu and SusilaKumaravelu	S.Kumaravelu, MurugaBhavanam, Chidambara Nagar, Nagarkoil-2.	1984

SEMESTER-VI

Elective - IV	B.Sc. Mathematics	2016 - 2017
M16UMAE04	MATHEMATICAL MODELING	
Credit: 4		

Unit I

Ordinary differential equation – Linear growth model – Growth of science and scientists – Non-linear growth and decay models – Diffusion of glucose or a medicine in the bloodstream.

Unit II

Modeling in population dynamics – Prey-predator models – Competition models – Multi-species models – Modeling of epidemics – Simple epidemic models – A model for diabetic-mellitus.

Unit III

Modeling in second order O.D. E. – Modeling of planetary motion – Motion under central force – Circular motion – Elliptic motion of a satellites – Rectilinear motion.

Unit IV

Modeling through difference equations – Linear difference equation – Obtaining complementary function by use of matrices – Harrod model – cob-web model – Applications of Actuarial science.

Unit V

Modeling through graphs – seven bridge problem – representing results of tournament – Genetic graph – Food web – Communication network – Matrices associated with a directed graph – Detection of clique – Terms of signed graph.

Text Book

J. N. Kapur, Mathematical Modeling , Wiley Eastern Limited, New Age International Pvt. Ltd., Reprint
2013.
Unit I Chapter 2 § 2.1 – 2.3 , 2.4.2
Unit II Chapter 3 § 3.1.1 – 3.1.3, 3.2.1 & 3.5.1
Unit III Chapter 4 § 4.1.1 – 4.3.1
Unit IV Chapter 5 § 5.2.1 – 5.2.6, 5.3.1, 5.3.2 & 5.3.4
Unit V Chapter 7 § 7.1.2 – 7.3.1

References

1. J. N. Kapur, Mathematical Models in Biology and Medicine, New Delhi, 1985.
2. R. Olink, Mathematical Models in Social and Life Sciences, 1978.

SEMESTER-VI

Elective - V	B.Sc. Mathematics	2016 - 2017
M16UMAE05	GRAPH THEORY	
Credit: 4		

Subject Description:

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

Goal:

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

Objectives:

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

Unit I

Introduction – Definition – Examples – Degrees – Definition – Theorem 1and corollary – Theorem 2and problems –sub graphs – definitions – Theorem – 1 - Operations on Graphs - definition – Theorem - 1 – problems.

Unit II

Introduction – Walks , Trails and paths – Definitions - Theorem – 1,2,3 - Connectedness and components –Definitions – Theorem – 1,2,3 - Definition – Distance – Theorem 1 – Definitions – Cut , Point , Bridge – Theorem 1,2,3,4 –Blocks – Definition – Theorem 1 – Connectivity – Definition – Theorem 1 - Definition.

Unit III

Introduction – Eulerian Graphs - definition – Lemmas 1 – Theorem – 1 - Konigsberg Bridge Problem – Corollary I and II – Definition – Theorem - Fleury's Algorithm – Hamiltonian Graphs – Definitions – Theorem 1,2,3 – Lemma – Definition (closure) - Theorem 1,2 – corollary – Theorem.

Unit IV

Introduction – Characterization of Trees – Theorem I – Corollary – Theorem 2 with corollary – Theorem 3 – Center of a Tree – Definition – Theorem.

Unit V

Introduction – Definition - Basic Properties – Definitions – Theorem 1 - Definitions – Theorem 2 - Definitions – Paths and connections – Definition - Theorem 1 - Definitions – Theorem 2 – Digraphs and Matrices – Definition– Theorem 1-Definition – Theorem 2 – Definition–Theorem3

Text Book

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Invitation to Graph Theory	S.Arumugam, S.Ramachandran	ScitechPublications,Chennai	2001

References

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Basics of Graph Theory	K.R.Parthasarathy	TMH Publishing company	2001
2.	Graph theory	S.Kumaravelu and Suseelakumaravelu	SKV Printers	1996
3.	A first course in Graph theory	A.Chandran	Macmillan Publishers, Chennai	1997

Additional Web Resources:

1. en.wikipedia.org/wiki/, 2.mathworld.wolfram.com, 3. wiki.answers.com

Assignments:

Assignments can be given from the following topics

1. Operations on Graphs.
2. Connectedness and components

Group Task:

Two Group Tasks can be given in the form of Seminar, Group Discussion, Quiz etc. in the topics

1. Hamiltonian Graphs
2. Digraphs

SEMESTER-VI

Elective - VI	B.Sc. Mathematics	2016 - 2017
M16UMAE06	PROBABILITY THEORY	
Credit: 4		

Unit – I

Introduction – probability Axioms – conditional probability – Baye's theorem – independent events – problems.

Unit II

Random variable – probability distribution of a random variable – Discrete and continuous variables – problems .

Unit – III

Expected value – Functions of a random variable – Moment generating functions – problems.

Unit – IV

Two point distribution – Binomial distribution – Poisson distribution – Gamma distribution – Normal distribution – Chebychev's inequality – problems.

Unit – V

Regression model – one way analysis of variance – Two way analysis of variance – problems.

Text Books:-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	An Introduction to Probability Theory and Mathematical Statistics	V.K.Rokatgi	Wiley Eastern Publications, NewDelhi	1985

Reference Books:-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Probability theory and Mathematical Statistics	MarekFiseh	John Wiley and sons, NewYork	1956

ALLIED MATHEMATICS – I

(For B.Sc. Statistics, Physics& Chemistry
Major Students admitted from the year 2016 - 2017 onwards)

Allied - I		2016 - 2017
M16UMAA01	ALGEBRA, INTEGRAL CALCULUS AND FOURIER SERIES	
Credit: 4		

Unit I

Definition of Matrix – Addition ,Subtraction , Multiplication of Matrices . Transpose of a Matrix – Adjoint of a Matrix – Inverse of the Matrix. Characteristic Equation – Eigen Values and Eigen Vectors – Cayley Hamilton Theorem (Statement only)

Unit II

Polynomial Equations – Imaginary and Irrational roots – Transformation of Equation – Descartes' rule of signs – Problems.

Unit III

Radius of Curvature in Cartesian and polar coordinates – Pedal Equation of a curve – Radius of curvature in P-R Coordinates.

Unit IV

Integral Calculus – Integration by Parts – Definite integrals and its properties – Reduction formula for $\int \cos^n x dx$, $\int \sin^n x dx$, $\int_0^{\pi/2} \sin^n x dx$, $\int_0^{\pi/2} \cos^n x dx$, $\int_0^{\infty} x^n e^{ax} dx$, $\int_0^{\infty} e^{-x} x^n dx$ – Problems.

Unit V

Fourier Series – Definition – To find the Fourier coefficients of periodic functions of period 2Π – even and odd functions – Half range series – problems.

Text Books:-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Algebra Volume-I	T.K.Manickavasagam Pillai and S.Narayanan.	Vijay Nicole Imprints Pvt Ltd, # C-7 Nelson Chmbers. 115,NelsonManickam Road, Chennai – 600029.	2004
2.	Algebra Calculus and Trigonometry	Dr.P.R.Vittal .	Margham Publications, 24, RameswaramRoad ,T.Nager, Chennai -600017.	2000

Reference Books:-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Calculus	N.P. Bali	Krishna PrakasanMandhir, 9, Shivaji Road, Meerut (UP).	1994.
2.	Calculus	D. Sudha	Emerald Publishers, 135, Anna Salai, Chennai – 600002.	1988

ALLIED MATHEMATICS - II

(For B.Sc. Statistics, Physics & Chemistry
Major Students admitted from the year 2016 - 2017 onwards)

Allied - II		2016 - 2017
M16UMAA02	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	
Credit: 4		

Unit I

Second order differential equation with constant coefficient - particular intergral of the type e^{ax}, cosαx or sinαx , x^n, e^{ax}V where V is any function of cosax or sinax or x or x^2

Unit II

Formation of partial differential equation by eliminating arbitrary constants and arbitrary functions – problems – definitions – complete, particular, singular and general integrals.

Unit III

Solutions of standard types of partial differential equations – clairauts's form.

Unit IV

Laplace transforms – definitions – Standard formula – Elementary theorems – problems.

Unit V

Inverse Laplace transforms – Standard formula – Elementary theorems – problems.

Text Books:-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Differential Equations and Laplace Transforms	Dr.P.R.Vittal	Margham Publications, Chennai -600017.	2002
2.	Allied Mathematics	Dr.P.R.Vittal .	Margham Publications, 24, RameswaramRoad ,T.Nager, Chennai - 600017.	2002
3.	Allied Mathematics	A.Singaravelu	Meenakshi Publishers,120,Pushpa Nagar, Medavakkam, Chennai – 601302.	2002

Reference Books:-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Engineering Mathematics	Gunavathi&Thilkavathy	Emerald Publishers, 135,AnnaSalai,Chennai – 600002.	1984
2.	Calculus	N.P.Bali.	Krishna Prakasam Mandir,9,Shivajiroad,Meerut(UP).	1994

ALLIED MATHEMATICS

(For B.Sc. Statistics, Physics & Chemistry
Major Students admitted from the year 2016 - 2017 onwards)

AlliedPractical		2016 - 2017
M16UMAAP01 Credit: 2	**ALLIED MATHEMATICS – PRACTICAL**	

Unit I, Unit II, Unit III First Semester / Third Semester 2 hours /week
Unit IV, Unit V Second Semester / Fourth Semester- 2 hour / week.

Unit I

Characteristic equation – Cayley Hamilton theorem – Problems

Unit II

n_{th}derivative – Leibnitz formula for n_{th} derivative – problems

Unit III

Partial differentiation – Partial derivatives of higher order – Homogeneous functions – Problems.

Unit IV

Scalar point function – gradient of scalar point functions – vector point functions – Divergence, curl of a vector point function – Solenoidal and irrotational vectors.

Unit V

Application of Laplace transforms to solve second order differential equations with constant coefficients

Text Books :-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Allied Mathematics	T.K.ManickavasagamPillai and S.Narayanan.	S.Viswanathan and Co., Chennai	1992
2.	Allied Mathematics	Dr.P.R.Vittal .	Margham Publications, 24, RameswaramRoad ,T.Nager, Chennai -600017.	2002
3.	Allied Mathematics	A.Singaravelu	Meenakshi Traders, Chennai	2002

ALLIED – I - MATHEMATICS

(For B.Sc., Computer science and B.C.A. Major Students admitted from the year 2016 - 2017onwards)

Allied - I		2016 - 2017
M16UMAA03	ALGEBRA , DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	
Credit: 4		

Unit I

Definition of Matrix – Addition ,Subtraction , Multiplication of Matrices . Transpose of a Matrix – Adjoint of a Matrix – Inverse of the Matrix-problems.

Unit II

Characteristic Equation – Cayley Hamilton Theorem (Statement only) - problems.

Unit III

Radius of Curvature in Cartesian and polar coordinates - Second order differential equation with constant coefficient - particular intergral of the type e^{ax} ,cosαx or sinαx , x^n .

Unit IV

Partial differentiation- partial differential equation by eliminating arbitrary constants and arbitrary functions – problems

Unit V

Laplace transforms – definitions – Standard formula – Elementary theorems – problems.

Text Books:-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Differential Equations and Laplace Transforms	Dr.P.R.Vittal	Margham Publications, Chennai -600017.	2002
2.	Allied Mathematics	Dr.P.R.Vittal .	Margham Publications, 24, RameswaramRoad ,T.Nager, Chennai - 600017.	2002
3.	Allied Mathematics	A.Singaravelu	Meenakshi Publishers,120,Pushpa Nagar, Medavakkam, Chennai – 601302.	2002

Reference Books:-

S.No	Title of the Book	Author	Publishing Company	Year of Publication
1.	Engineering Mathematics	Gunavathi&Thilkavathy	Emerald Publishers, 135,AnnaSalai,Chennai – 600002.	1984
2.	Calculus	N.P.Bali.	Krishna Prakasam Mandir,9,Shivajiroad,Meerut(UP).	1994

NON MAJOR ELECTIVE COURSE (Group - A)

(B.A., Tamil,B.Sc., Chemistry and B.Com CA. Major Students admitted from the year 2016– 2017 onwards)

NMEC - I		2016 - 2017
M16UMAN01 Credit: 2	**COMPETITIVE EXAMINATION - I**	

Unit I

H.C.F. and L.C.M.

Unit II

Square Roots and Cube Roots – Averages.

Unit III

Problems on Numbers – Problems on Ages.

Unit IV

Percentages -Surds and Indices

Unit V

Profit and Loss

Text Books:

S.No	Name of the Book	Author	Ppublishing Company	Year Of Publication.
1.	Quantitative Aptitude For Competitative Examinations	R.S.Aggarwal	S.Chand Co Ltd ,152,Annasalai, Chennai.	2001

[OR]

NMEC - II		2016 - 2017
M16UMAN02	MATRIX ALGEBRA	
Credit: 2		

Unit I

Definition of Matrix – Addition ,Subtraction , Multiplication of Matrices .

Unit II

Transpose of a Matrix – Adjoint of a Matrix – Inverse of the Matrix.

Unit III

Symmetric , Skew symmetric , Hermitian and Skew Hermitian Matrix – Problems.

Unit IV

Rank of The Matrix – Definition – Finding Rank of the Matrix – Problems upto 3x3 Matrix.

Unit V

Cayley Hamilton Theorem (statement only) – Problems only.

Text Books :

S.No	Name of The Book	Author	Publishing Company	Year of Publications
1.	Allied Mathematics	Dr.P.R.Vittal	Margham Publications,Chennai -!7	2000

NON MAJOR ELECTIVE COURSE (Group - B)

NMEC - III		2016 - 2017
M16UMAN03	COMPETITIVE EXAMINATION- II	
Credit: 2		

Unit I

Partnership

Unit II

Simple interest

Unit III

Compound interest

Unit IV

Area.

Unit V

Odd man out &series

Text Books:

S.No	Name of the Book	Author	Publishing Company	Year Of Publications
1.	Quantitative Aptitude for competitative Examinations	R.S.AggarWal	S.Chand Co Ltd ,152 ,Annasalai ,Chennai.	2001

[OR]

NMEC - IV		2016 - 2017
M16UMAN04	NUMERICAL METHODS	
Credit: 2		

Unit I

Solution of algebraic and Transcendental Equations – Bisection Method - Newton – Raphson Method.

Unit II

Finite difference – Definition – First difference – Higher differences – Difference tables – Expression of any value of y in terms of the initial value y_0 and differences.

Unit III

Newton Forward difference – Simple problems.

Unit IV

Newton Backward difference – Simple problems.

Unit V

Central differences – Properties of the operator D – simple problems.

Text Books:

S.No	Name of the Book	Author	Publishing Company	Year Of Publication
1.	Introductory methods of Numerical Analysis – 2nd Edition	S.S.Sastry	Prentice Hall of India PvtLtd,New Delhi	1990
2.	Numerical Methods in Science and Engineering – 2nd Edition (revised)	Dr.M.K.Venkataraman	The National Publishing Company,Chennai.	

VALUE ADDED COURSES

(For B.Sc., Computer science and B.C.A. Major Students admitted from the year 2016– 2017 onwards)

VAC - I		2016 - 2017
M16UVA05	**COMPETITIVE EXAMINATION**	
Credit: 2		

Unit I

Time & Work

Unit II

Pipes & Cistern

Unit III

Time & Distance

Unit IV

Problems on Trains

Unit V

Boats &Streams

Text Books:

S.No	Name of the Book	Author	Publishing Company	Year Of Publications
1.	Quantitative Aptitude for competitative Examinations	R.S.AggarWal	S.Chand Co Ltd ,152 ,Annasalai ,Chennai.	2001

VAC - II		2016 - 2017
M16UVA06 Credit: 2	**VERBAL AND LOGICAL REASONING**	

Unit I

Verbal Reasoning

Unit II

Non- Verbal Reasoning

Unit III

Problems on seating Arrangements

Unit IV

Family based on problems

Unit V

Odd Man out series

Text Books:

S.No	Name of the Book	Author	Publishing Company	Year Of Publications
1.	Verbal and Logical Reasoning	R.S.AggarWal	S.Chand Co Ltd, 152, Annasalai,Chennai.	2001