ANNEXURE - 8

CHOICE BASED CREDIT SYSTEM – STRUCTURE

FROM THE ACADEMIC YEAR 2017–18

B.Sc MATHEMATICS WITH COMPUTER APPLICATIONS

SEM	Part – I	Part – II	Part – III				Part – IV			Part – V (6th Hr)	ACC (6th Hr)			SLC
I Sem.	I Lang (6)	II Lang (6)	Core (5)	Core (5)	Allied Maths CA (4)	Allied Maths CA Lab (2)	SBE (2)	–	**Total (30)**	NCC/NSS/PED. (3)	Com.Eng (2)	Comp.Lit (1)	–	–
II Sem.	I Lang (6)	II Lang (6)	Core (4)	Core (5)	Allied Maths CA (4)	Allied Maths CA Lab (2)	SBE (2)	Elec. EVS (1)	**Total (30)**	NCC/NSS/PED. (3)	Com.Eng (2)	Comp.Lit (1)	–	Law and Society
III Sem.	I Lang (6)	II Lang (6)	Core (6)	Core Lab (2)	Allied Maths CA (4)	Allied Maths CA Lab (2)	NME (2)	SBE (2)	**Total (30)**	NCC/NSS/PED. (3)	Com.Eng (2)	Comp.Lit (1)	–	Human Rights
IV Sem.	I Lang (6)	II Lang (6)	Core (6)	Core Lab (2)	Allied Maths CA (4)	Allied Maths CA Lab (2)	NME (2)	SBE (2)	**Total (30)**	NCC/NSS/PED. (3)	Com.Eng (2)	Comp.Lit (1)	–	Number theory
V Sem.	Core (6)	Core (6)	Core (4)	Core (4)	Core Lab (2)	Elec. (5)	SBE (2)	Elec. W.S. (1)	**Total (30)**	–	Com.Eng (2)	Comp.Lit (1)	Skill Devt – Career Guidance (3)	History of Mathamatics
VI Sem.	Core (6)	Core (4)	Core (4)	Core Lab (2)	Elec.II (5)	Elec.III (5)	SBE (2)	Elec. VBE (2)	**Total (30)**	–	Com.Eng (2)	Comp.Lit (1)	Skill Devt – Career Guidance (3)	—
								TOTAL	**180 Hrs**					

I Language	–	Tamil
II Language	–	English
SBE	–	Skill – Based Electives
SLC	–	Self – Learning Course
EVS	–	Environmental Studies
W.S.	–	Women Studies

CHOICE BASED CREDIT SYSTEM – STRUCTURE

FOR THOSE WHO HAVE JOINED FROM THE ACADEMIC YEAR 2017–18 ONWARDS

B.Sc MATHEMATICS WITH COMPUTER APPLICATIONS

Part	Course	Subject	Code	Hrs.	6th Hr.	Cr.	Adl. Cr.	Exam (Hrs)	Marks	
									Int.	Ext.
SEMESTER - I										
I	Lang. – I	Tamil – I	170103101	6		3		3	25	75
II	Lang. – II	English – I	171003101	6		3		3	25	75
III	Core	Calculus [Common]	173103101	5		5		3	25	75
	Core	Analytical Geometry of 3D and vector calculus [Common]	173103102	5		5		3	25	75
	Al.Maths CA	PC Software	173103121	4		4		3	25	75
	Al.Mat.CA Lab	Ms Office and DTP lab	173103122	2		1		3	40	60
IV	SBE - I	Basic Algebra(common)	174403131	2		2		2	25	75
V	Extension activities	NSS / NCC / PED	–		3			–	–	–
	Additional Courses	Communicative English–I	–		2			–	–	–
		Computer Literacy	–		1			–	–	–
SEMESTER - II										
I	Lang. – I	Tamil – II	170103201	6		3		3	25	75
II	Lang. – II	English – II	171003201	6		3		3	25	75
III	Core	Sequences and Series & Trigonometry (common)	173103201	4		4		3	25	75
	Core	Differential Equation and Laplace Transformation [Common]	173103202	5		4		3	25	75
	Al.Maths.CA	Programming in C	173103221	4		4		3	25	75
	Al.Mat.CA.Lab	C Lab	173103222	2		1		3	40	60
IV	SBE - II	Theory of Equations (common)	174403231	2		2		2	25	75
	EVS	Environmental Studies	174103201	1		1		2	–	100
V	Extension activities	NSS / NCC / PED	–		3			–	–	–
	Additional Courses	Communicative English–I	178003201		2		1	3	25	75
		Computer Literacy	–		1			–	–	–
	SLC	Law and Society	178003202				3	3	–	100
SEMESTER - III										
I	Lang. – I	Tamil – III	170103301	6		3		3	25	75
II	Lang. – II	English – III	171003301	6		3		3	25	75
III	Core	Modern Algebra	173103301	6		5		3	25	75
	Core Lab	Application of Differential Equations Lab	173103302	2		1		3	40	60
	Al.Mat.CA	Object oriented Programming with C++	173103321	4		4		3	25	75
	Al.Mat.CALab	C++ Lab	173103322	2		1		3	40	60
IV	NME - I	Basic Maths – I	174603331	2		2		2	25	75
	SBE - III	Quantitative Aptitude - I	174403331	2		2		2	25	75
V	Extension activities	NSS / NCC / PED	–		3			–	–	–
	Additional Courses	Communicative English–II	–		2			–	–	–
		Computer Literacy	–		1			–	–	–
	SLC	Human Rights	178003301				3	3	–	100

Part	Course	Subject	Code	Hrs.	6th Hr.	Cr.	Adl. Cr.	Exam (Hrs)	Marks	
									Int.	Ext.
SEMESTER - IV										
I	Lang. – I	Tamil – IV	170103401	6		3		3	25	75
II	Lang. – II	English – IV	171003401	6		3		3	25	75
III	Core	Linear Algebra	173103401	6		5		3	25	75
	Core Lab	Combinatorial Mathematics Lab	173103402	2		1		3	40	60
	Al.Mat.CA	Java programming	173103421	4		4		3	25	75
	Al.Mat.CA lab	Java Lab	173103422	2		1		3	40	60
IV	NME - II	Basic Maths – II	174603431	2		2		2	25	75
	SBE - IV	Quantitative Aptitude - II	174403431	2		2		2	25	75
V	Extension activities	NSS / NCC* / PED*	–		3	1		3	25 *40	75 *60
	Additional Courses	Communicative English–II	–		2		1	3	25	75
		Computer Literacy	–		1			–	–	–
	SLC	Number Theory	178003431				4	3	–	100
SEMESTER - V										
III	Core	Real Analysis(Common)	173103501	6		5		3	25	75
	Core	Operations Research (Common)	173103502	6		4		3	25	75
	Core	Visual programming	173103503	4		4		3	25	75
	Core	Mechanics	173103504	4		2		3	25	75
	Core Lab	Visual programming Lab	173103505	2		2		3	40	60
	Elective	Elective – I	-	5		5		3	25	75
IV	SBE - V	Astronomy	174403531	2		2		2	25	75
	WS	Women Studies	174503501	1		1		2	–	100
	Additional Courses	Communicative English–III	–		2			–	–	–
		Computer Literacy	–		1			–	–	–
		Skill Development – Career Guidance	–		3			–	–	–
	SLC	History of Mathematics	178003531				4	3	–	100
SEMESTER - VI										
III	Core	Complex Analysis	173103601	6		5		3	25	75
	Core	.Net Programming	173103602	4		4		3	25	75
	Core	Numerical Analysis	173103603	4		2		3	25	75
	Core Lab	.Net Lab	173103604	2		2		3	40	60
	Elective	Elective – II	-	5		5		3	25	75
	Elec. - III	Project *Report;@Viva	173103607	5		5		–	40 [24:16]	60 [36:24]
IV	SBE - VI	Graph theory	174403631	2		2		2	25	75
	VBE	Value Based Education	174303601	2		2		2	–	100
	Additional Courses	Communicative English–III	178003601		2		1	3	25	75
		Computer Literacy	178003602		1		1	3	–	100
		Skill Development – Career Guidance	178003603		3		2	3	–	100
		TOTAL		**180**	**36**	**140**	**20**			

***Elective I and II: Each elective paper has two choices, select any one.**

1.1 Mathematical Statistics - I - 173103506

1.2 Functional Analysis - 173103507

2.1 Mathematical Statistics – II - 173103605

2.2 Stochastic Processes - 173103606

	ALLIED – MATHEMATICS FOR INFORMATION TECHNOLOGY						
Sem	**Title of the Paper**	**SUB CODE**	**Hrs.**	**Cr.**	**Exam (Hrs)**	**Marks Allotted**	
						Int.	**Ext.**
III	Discrete Mathematics	173103323	4	4	3	25	75
IV	Resource management Techniques	173103423	4	4	3	25	75

B.Sc MATHEMATICS WITH COMPUTER APPLICATIONS: Those Who Have Joined From The Academic Year 2017 – 18 Onwards Under CBCS System

Core Subject **REAL ANALYSIS** **Code: 173103501**
SEMESTER V **6 Hrs/Week**
Credits 5

Objective:

- ***To provide fundamental ideas and properties about metric spaces, convergence, Completeness and compactness.***

UNIT – I: **[15 Hrs]**

Countable sets – Uncountable sets – Inequalities of Holder, Cauchy – Schwartz and Minkowski – Metric space – Definition and examples – Bounded sets in a metric space - Equivalent metrics.

UNIT – II: **[15 Hrs]**

Open ball and open set – Definition and Examples – Subspace – Open set in a subspace – Interior points – Closed ball – Closed set – Closure – Limit point – Dense set.

UNIT – III: **[15 Hrs]**

Complete metric space – Definition and examples – Cantor's intersection theorem – Baire's category theorem.

UNIT – IV: **[15 Hrs]**

Continuity – Uniform continuity – Connected set – Connected subset of R – Connectedness and continuity - Discontinuous functions

UNIT – V: **[15 Hrs]**

Compactness – Heine – Borel Theorem – Finite intersection property – Totally bounded set – Compactness and continuity (sequentially compact is excluded).

TEXT BOOK:

S.Arumugam and Isaac, Modern Analysis, New Gramma Publishing House, Palayamkottai, 2007 Edition.

Chapters:

UNIT – I	:	1.2 to 1.4 and 2.1. to 2.2
UNIT – II	:	2.3. to 2.10
UNIT – III	:	3.1. to 3.2
UNIT – IV	:	4.1, 4.3, 4.4, 5.1. to 5.3
UNIT – V	:	6.1. to 6.4

REFERENCE:

Golds Berg, Real Analysis, Oxford & IBH Publishing Co. Delhi.

Core Subject **OPERATIONS RESEARCH** **Code: 173103502**
SEMESTER V **6 Hrs/Week**
Credits 4

Objectives:

- ***To introduce a fundamental knowledge of formation of Linear programming problem.***
- ***To motivate the learners to find the solutions.***

UNIT – I: **[18 Hrs]**

Mathematical formulation of the problem – Examples of linear programming problem – Simple examples – Graphical solution method – some exceptional cases – General Linear Programming problem – Canonical and standard forms of L.P.P. – solutions of L.P.P. – Basic solutions – Simplex method – Charne's method of penalties, or Big M– Method and two phase method.

UNIT – II: **[18 Hrs]**

Introduction – Primal – Dual pair – Formulating a Dual problem – primal – Dual pair in Matrix form – Duality theorems – complementary slackness theorem - Duality and simplex method – Dual simplex method.

UNIT – III: **[18 Hrs]**

Transportation problem – LP formulation of the Transportation problem – Finding an Initial Basic feasible solutions by North West Corner Rule, Matrix minima (least – cost) method and Vogel's approximation method - Optimum solution by the modified distribution method (MODI method)– special cases in transportation problem – Assignment problem - mathematical formulation of the problem - solution of Assignment problem - special cases in Assignment problem – the travelling salesman problem.

UNIT – IV: **[18 Hrs]**

Game Theory – Two person zero sum games – the maximin and Minimax principle – Solution of Game with Saddle points – Solution of game without saddle points – Mixed strategies – Graphical method – Method of dominance – general solution of (mxn) rectangular games by linear programming method.

UNIT – V: **[18 Hrs]**

Network scheduling by PERT/CPM - Introduction – Network – Basic components – logical sequencing – Rules of Network construction – Numbering the Events – concurrent Activities – Critical path Analysis.

TEXT BOOK:

Kanthi Swarap and Others, Operation Research, Sultan Chand and Sons, New Delhi.

UNIT – I : 2.3, 2.4, 3.2 to 3.5, 4.1, 4.3, 4.4
UNIT – II : 5.1 to 5.7, 5.9
UNIT – III :10.2, 10.8 to 10.10, 10.13, 11.2, 11.3, 11.4, 11.7
UNIT – IV : 17.2, 17.4 to 17.7, 17.9
UNIT – V : 25.1 to 25.6

REFERENCES:

1. Gupta R.K., Operations Research, Krishna Pragasam Mandir, Meerut.
2. Panner Selvam, Operations Research, Prentice Hall of India, New Delhi.

Core Subject **VISUAL PROGRAMMING** **Code: 173103503**
SEMESTER V **4 Hrs/Week**
Credits 4

Objectives:-

- ***To introduce the fundamental concepts of Visual Basic Programming.***
- ***To lay the foundation for future studies in Visual Basic Programming.***

UNIT – I: **[12 Hrs]**

Starting a new project – Properties window – Form, Scale, Properties – Printing form – Tool box – Creating controls – Name property – Properties of command button – Simple event procedures for command button – Image control – Text boxes – Labels – Message boxes – The grid.

UNIT – II: **[12 Hrs]**

The code window – Statements in VB – Variables – Setting properties with code – Data types – Working with variables – More on strings – More on numbers – Constants – Input boxes – Format function – Rich text boxes.

Determinate loops – Indeterminate loops – Making decisions (conditionals) – Select case – Nested IF – Then – GOTO.

UNIT – III: **[12 Hrs]**

String functions – The Rnd function – Numeric function – Date and Time function – Function procedures – Sub procedures – Advanced uses of procedures and functions – One dimensional array – Arrays with more than one dimension.

UNIT – IV: **[12 Hrs]**

Control array – List and combo boxes – The flex grid control – The tool box revisited – Common dialog boxes – Common controls 6.0 – Menus – MDI forms.

UNIT – V: **[12 Hrs]**

A survey of database development using visual basic: using data control – SQL basics – An introduction to programming with database objects – Other useful methods and events for the data control.

TEXT BOOK:

Gary Cornell, Visual Basic 6 from the Ground Up, Tata McGraw – Hill Publications, Reprint 2003.

UNIT – I : Chapter 3, 4
UNIT – II : Chapter 5, 6, 7
UNIT – III : Chapter 8, 9, 10
UNIT – IV : Chapter 11, 14
UNIT – V : Chapter 22

REFERENCE:

Steven Holzner I., Visual Basic 6 Programming, Dream Tech Press, Reprint 2006.

Core Subject **MECHANICS** **Code: 173103504**
SEMESTER V **4 Hrs/Week**
Credits 2

Objectives:

- ***To give Comprehensive idea of the solid bodies at rest.***
- ***To impact techniques of solving problems in statics.***
- ***To give Comprehensive idea of the motion of the solid bodies.***
- ***To motivate the learners to find the solutions.***

UNIT – I: **[12 Hrs]**

Forces acting at a point –Resultant and components – Parallelogram law of forces – Analytic expression for the resultant of two forces acting at a point.Triangle law of forces- Perpendicular triangle of forces- The polygon of forces –Lami's Theorem.

UNIT – II: **[12 Hrs]**

Resolution of a force – Components of a force along two given Directions-Theorems on Resolved parts –Resultant of any number of Forces acting at a point:Graphical method - Resultant of any number of Coplanar forces acting at point;analytical method – Condition for equilibrium.Parallel forces –Resultant of two like and unlike parallel Forces- Resultant of a number of parallel forces acting on a rigid body – Condition of equilibrium of three coplanar parallel forces – Centre of two parallel forces.

UNIT – III: **[12 Hrs]**

Moment of a force- Physical Significance of the moment of a force- Geometrical Representation of a moment –Sign of the moment – Unit of Moment – Varigon's Theorem of moments.

UNIT – IV: **[12 Hrs]**

Projectile –Path of a projectile –Characteristics of the motion of A projectile –Two possible directions to obtain a given horizontal range-Simple Problems only-Laws of Impact –Impact on a fixed plane.

UNIT – V: **[12 Hrs]**

Direct and Oblique Impact –Simple Harmonic Motions-Equation of motion –Composition of Two Simple Harmonic Motions.

TEXT BOOKS:

1. M. K. Venkatraman, Statics, 12th edition, Agasthiar Publications, Trichy, 2006.
2. M.K.Venkatraman, Dynamics,12th edition, Agasthiar Publications, Trichy, 2006.

Unit I : Textbook 1chapter II – 1,2,3,4,5,6,7,8,9 (P.No. 6-26, Examples 9-13)

Unit II: Textbook 1chapter II – 11,12,13,14,15,16, chapter III - 2,3,4,5,6 (P.No. 36-50, 52-59)

Unit III : Textbook 1chapter III – 7,8,9,10,11,12 (P.No. 61-66, 68, Examples 4,5)

Unit IV : Textbook 2 Chapter 6.1 to 6.5,6.8,8.3,8.4 (P.No. 139 - 143, 144-150(Problems) 156-160, 216-228)

Unit V : Textbook 2 Chapter 8.5,8.6,8.7,10.2,10.3,10.6,10.7 (P.No.232-241, 244,309-314, 317-322, 327-330)

REFERENCE:

Durai Pandian, P.,Laxmi Durai Pandian and Muthamzh D, Mechanics, ,S Chand and Company Limited, New Delhi, 2007.

Core Lab **VISUAL PROGAMMING LAB** **Code: 173103505**

SEMESTER V

2 Hrs/Week
Credits 2

Objectives:

- ***To give hands on training in Visual Basic Programming.***

1. Animation.
2. Armstrong number
3. Colour pallet.
4. Calculator.
5. Date and time formation.
6. Library management.
7. Mouse move event.
8. Objective type questions.
9. Stock Inventory
10. String manipulation.

Elective-I **1. MATHEMATICAL STATISTICS – I** **Code: 173103506**

SEMESTER V

5 Hrs/Week
Credits 5

Objective:

- ***To provide basic knowledge about statistical tools.***

UNIT – I: **[15 Hrs]**

Measure of Central tendencies: Arithmetic Mean, Median and mode. Measure of Dispersion: Range – Quartile deviation – Mean deviation – Standard deviation.

UNIT – II: **[15 Hrs]**

Moments Skewness and kurtasis - Curve fitting: Principle of least squares – Fitting a straight line – Fitting a second degree parabola – Fitting a curve of the form (i) $y=bx^a$ (ii) $y=ab^x$ (iii) $y=ae^{bx}$.

UNIT – III: **[15 Hrs]**

Correlation and Regression: Correlation – Rank correlation – Regression lines – Correlation coefficient for a bivariate frequency distribution.

UNIT – IV: **[15 Hrs]**

Theory of Attributes: Attributes – Consistency of data – Independence and association of Data.

UNIT – V: **[15 Hrs]**

Index numbers: Simple index numbers – weighted index numbers – consumer price index numbers.

TEXT BOOK:

Dr. S.Arumugam Isaac, Statistics, New Gamma Publications.

UNIT – I	:	2.1, 2.2(Median only) 2.3, 3.1
UNIT – II	:	4.1, 4.2, 5.1
UNIT – III	:	6.1, 6.2, 6.3, 6.4
UNIT – IV	:	8.1, 8.2, 8.3
UNIT – V	:	9.1 to 9.2

REFERENCES:

1. Kapoor V.K., Fundamentals of Statistics, S.Chand & Co.,
2. Gupta S.P., Statistical Methods, S.Chand & Co.,

Elective -I **2. FUNCTIONAL ANALYSIS** **Code: 173103507**
SEMESTER V **5 Hrs/Week**
Credits 5

Objective:

- ***To provide a basic knowledge of the concepts and theorems in functional analysis.***

UNIT – I: **[15 Hrs]**

Normed spaces – continuity of linear maps – Hahn – Banach theorem.

UNIT – II: **[15 Hrs]**

Banach space – uniform boundedness principle – closed graph theorem and open mapping theorem.

UNIT – III: **[15 Hrs]**

Bounded inverse theorem – spectrum of a bounded operator.

UNIT – IV: **[15 Hrs]**

Duals and transposes – duals of L^p

UNIT – V: **[15 Hrs]**

Weak and Weak* convergence – Reflexivity.

TEXT BOOK:

Limaye B.V., (2010), functional analysis, New Age international publishers, Third Edition

UNIT – I	:	chapter 2– sec 5, 6, 7 Pg (62 – 120)
UNIT – II	:	chapter 2– sec 8 pg (124 – 134)
		chapter 3 – sec 9, 10 pg (138 – 178)
UNIT – III	:	chapter 3– sec 11, 12 pg (182 – 211)
UNIT – IV	:	chapter 3– sec 13, 14 (216 – 255)
UNIT – V	:	chapter 4– sec 15, 16 pg (260 – 298)

REFERENCE:

Somasundaram D., A First course in functional analysis (2013)

Part – IV **ASTRONOMY** **Code: 174403531**
Skill Based Elective-V **SEMESTER VI** **2 Hrs/Week**
Credits 2

Objectives:

- ***To provide the basic knowledge of the celestial bodies.***

UNIT – I: **[6 Hrs]**

Spherical trigonometry – Spherical triangle – Formulae (without proof) – Simple Problems.

UNIT – II: **[6 Hrs]**

Celestial sphere – Four systems of celestial Co–ordinates – Problems – Simple Problems only.

UNIT – III: **[6 Hrs]**

Sidereal times – West hour angle – Latitude of a place – Duration of day and night time. Azimuth of a star at rising - Simple Problems only.

UNIT – IV: **[6 Hrs]**

The variations in the duration of day and night during a year (Article 88).

UNIT – V: **[6 Hrs]**

Dip of horizon – Circum polar stars. Simple Problems only.

TEXT BOOK:

Prof. S.Kumaravelu, Prof. Susheela Kumaravelu, Astronomy, Reprinted 2007, S.K.V.Publications, Nagerkoil.

UNIT – I	:	Chapter I
UNIT – II	:	Chapter II– pg (41 – 58)
UNIT – III	:	Chapter II – pg (59 – 74)
UNIT – IV	:	chapter III– Article 88 only
UNIT – V	:	Section – 5 & chapter II– pg (77 – 87)

REFERENCE:

Ramachandran G.V., Astronomy, S.K.V. Publications, Nagerkoil.

Self Learning Course HISTORY OF MATHEMATICS Code: 178003531

SEMESTER V Addl. Credits 4

Objective:

- ***To provide the basic knowledge of the history of mathematics.***

UNIT – I:

Foundations of Mathematics – the arithmetic method – Geometry according to Enclid – Non – Euclidean Geometry – the formal Axiomatic method – Description of the formal axiomatic method – Analysis of the axiomatic method – consistency of an axion system – independence of Axions – completeness of an axion system – categoricalness of an axion system – Advantages and disadvantages of the axiomatic method.

UNIT – II:

The Genetic method – the theory of sets – Equivalent sets – cardinal numbers – cantor's Diagonal procedure – The Axion of choice – objections to cantor's theory – paradoxes in set theory.

UNIT – III:

Axiomatic set theory – the Three schools of thought – Logicism – Aristotle's logic – symbolic logic – Basic symbols – propositions and propositional functions – the primitive propositions – propositional calculus – truth – tables method – the predicate calculus.

UNIT – IV:

The ancient and medieval period – Messopotaamia – Egypt, Greece – Pythagorean arithmetic – Pythagorean geometry – The Athenian school – Hellenistic mathematics – Pappus and Disphantus.

UNIT – V:

The modern period – the sixteenth century – the seventeenth century – Descartes, Pascal, Newton, Leibnity, Te Bernoullis – The Eighteenth century – Euler, Maclaurin, Lagrange – The nineteenth century. Gauss, poisson, fourier, Cauchy, Galosis, Hamilton, Book, Weierstrass, canton – Twentieth century – Ramanujan.

TEXT BOOK:

Narayanan K.S., A History of Mathematics, Taj printers, Tirunelveli, Reprint Jan 1985.

Core Subject **COMPLEX ANALYSIS** **Code: 173103601**
SEMESTER VI **6 Hrs/Week**
Credits 5

Objectives:

- ***To introduce a fundamental knowledge of Complex Analysis.***
- ***To motivate the learners to find the solutions.***

UNIT – I: **[18 Hrs]**

Limits – Continuity – Derivatives – Analytic functions -

UNIT – II: **[18 Hrs]**

Transformation – Bilinear Transformation – Cross ratio – Special bilinear transformation.

UNIT – III: **[18 Hrs]**

Definite Integrals – Properties of Definite Integrals – Contours – Line integrals – Cauchy's Integral theorem – Extension of Cauchy's Integral theorem - Cauchy's Integral Formula.

UNIT – IV: **[18 Hrs]**

Derivatives of analytic functions – Morera's theorem - Cauchy's inequality – Liouville's theorem – Fundamental theorem of Algebra - Maximum Modulus theorem.

UNIT – V: **[18 Hrs]**

Taylor's series – Laurent's series – Zeros of an Analytic function – Singularities – Riemann's theorem. Residues - Cauchy's Residue theorem.

TEXT BOOK:

T.K. Manica Vachagam Pillay and others – Complex Analysis.
Unit 1 – chapter 2 - P.No. 21-55
Unit 2 – chapter 3 - P.No. 57-93

Unit 3 – chapter 4 - P.No. 95-109, 115 -119, 126 -131
Unit 4 – chapter 5 (143 to 172) P.No. 119-125, 132 - 137
Unit 5 – chapter - 6 - P. No. 139-166, 168 - 171, 173 -187.

REFERENCES:

S.Arumugam and others – Complex Analysis.

Core Subject **.NET PROGRAMMING** **Code: 173103602**
SEMESTER VI **4 Hrs/Week**
Credits 4

Objectives:

- ***To introduce the fundamental concepts of .Net Programming.***
- ***To lay the foundation for future studies in .Net Programming.***

UNIT – I: **[12 Hrs]**

Introduction – Visual of language elements – Adding event procedure – Adding controls – Additional event procedure – Creating a main menu.

Data types, arithmetic operations, strings – Variable and declaration statements – Named constants – Assignment statements – Using instring functions – Adding event code – The basic of form design – Errors and problems.

UNIT – II: **[12 Hrs]**

Interactive user input – Formated output – Printer output – Selection controls – Relational Expressions – The IF…Then… Else structure.

UNIT – III: **[12 Hrs]**

Pretest and posttest loops – Fixed count versus variable condition loops – Do while loops – Interactive Do while loops – For – Next loops – Exit controlled loops.

UNIT – IV: **[12 Hrs]**

Sub and function procedures: Sub procedure - Passing arguments by values and by reference – Function procedures – Variable scope – Recursion.

Arrays and strings: One dimensional arrays – Additional array capabilities.

UNIT – V: **[12 Hrs]**

Accessing databases: Introduction – Using ADO.NET with VB – Updating a dataset – Creating dataset using SQL.

Web applications: Client/Server and web applications – Simple web applications.

TEXT BOOK:

Gary Bronson and David Rosenthal, Introduction to Programming with Visual Basic .NET, Indian Edition, Viva Books Private Limited, 4737/23, Ansari Road, Daryagank, New Delhi – 2.
Chapters:

UNIT – I : 2.1 to 2.6, 3.1 to 3.8
UNIT – II : 4.1 to 4.3, 5.1 to 5.5
UNIT – III : 6.1 to 6.6
UNIT – IV : 7.1 to 7.5, 8.1 to 8.2
UNIT – V : 9.1 to 9.4, 11.1 to 11.2

REFERENCE:

Steven Holzner, Visual Basic .NET Programming – Black Book, Dream Tech Press.

Core Subject **NUMERICAL ANALYSIS** **Code:173103603**
SEMESTER VI **4 Hrs/Week**
Credits 2

Objective:

- ***This subject is helpful for computing knowledge about mathematical concepts.***

UNIT – I: **[12 Hrs]**

Solution of Numerical, Algebraic and Transcendental equations: Bisection method – Iteration method – Regula falsi method – Newton – Raphson method.

UNIT – II: **[12 Hrs]**

Solution of simultaneous linear Algebraic Equations: Gauss Elimination method – Gauss –Jordan method – Gauss – Jacobi method - Gauss seidel method.

UNIT – III: **[12 Hrs]**

Finite differences: Operators - Newton's Forward and Backward interpolation formula – Divided differences - Newton's Divided Interpolation formula – Lagrange's interpolation formula.

UNIT – IV: **[12 Hrs]**

Numerical Differentiation: Derivatives using – Newton's forward and backward difference formula.

Numerical integration: Trapezoidal rule - Simpson's 1/3 rule – Simpson's 3/8 rule.

UNIT – V: **[12 Hrs]**

Numerical solution of an ordinary differential equations: Taylor series method – Euler's method – Runge kutta method.

TEXT BOOK:

P.Kandasamy and Thilagavathi K., Calculus of Finite Differences and Numerical Analysis, S.Chand & Co. New Delhi.

UNIT – I : 1.1, 1.2, 1.3, 1.4
UNIT – II : 2.1,2.2, 2.5, 2.6
UNIT – III : 4.2, 4.3, 6.2, 6.5, 6.6, 6.7
UNIT – IV : 7.2, 7.3, 7.7, 7.9, 7.13, 7.14
UNIT – V : 9.5, 9.7, 9.10

REFERENCES:

S.Arumugam and Issac, Numerical Analysis, New Gamma Publications.

Core Lab **.NET LAB** **Code : 173103604**

SEMESTER VI **2 Hrs / Week**

Credits 2

Objectives:

- ***To give hands on training in Visual Basic .Net Programming:***

1. Find the factorial Value
2. Find the biggest number
3. Find the biggest number using array
4. Find the student grade
5. Calculate Foreign exchange
6. Read only and write only
7. Find sum of digits
8. Adding two numbers
9. Class event
10. Sub procedure

Elective-II **1. MATHEMATICAL STATISTICS – II** **Code: 173103605**

SEMESTER VI **5 Hrs/Week**

Credits 5

Objective:

- ***To provide the basic knowledge about Research tools.***

UNIT – I: **[15 Hrs]**

Probability: Probability – Conditional Probability – Random Variables: Random Variables – Discrete random variables – Continuous random variables.

UNIT – II: **[15 Hrs]**

Mathematical Expectation – Moment generating functions.

UNIT – III: **[15 Hrs]**

Binomial Distribution – Poisson Distribution – Normal Distribution.

UNIT – IV: **[15 Hrs]**

Tests of significance (Large samples): Sampling – Sampling Distribution – Testing of Hypothesis – Procedure for Testing of Hypothesis for large samples – Tests of Significance for Large Samples.

UNIT – V: **[15 Hrs]**

Tests of Significance (small samples): Test of significance based on t–distribution – Test of significance based on F–test.

TEXT BOOK:

Dr. S.Arumugam Isaac, Statistics, New Gamma Publications.

UNIT – I	:	11.1, 11.2, 12.1 to 12.3
UNIT – II	:	12.4, 12.5
UNIT – III	:	13.1 to 13.3
UNIT – IV	:	14.1 to 14.5
UNIT – V	:	15.1, 15.2

REFERENCES:

1. Kapoor V.K., Fundamentals of Statistics, S.Chand & Co.,
2. Gupta S.P., Statistical Methods, S.Chand & Co.,

Elective-II **2. STOCHASTIC PROCESSES** **Code: 173103606**

SEMESTER VI **5 Hrs/Week**

Credits 5

Objective:

- ***To provide a basic knowledge of applied stochastic processes.***

UNIT – I: **[15 Hrs]**

Stochastic processes: An Introduction – Specification of stochastic processes.

UNIT – II: **[15 Hrs]**

Markov chains – Definitions and examples – Transition matrix – order of a Markov chain – Markov chains as Graphs.

UNIT – III: **[15 Hrs]**

Higher Transition probabilities – chapman – Kolmogorov equation – Markov Bernouli chain – correlated Random walk

UNIT – IV: **[15 Hrs]**

Classification of states and chains – Basic limit theorem.

UNIT – V: **[15 Hrs]**

A periodic chain – limiting behaviour – stability of a Markov system.

TEXT BOOK:

Medhi J., Stochastic processes, 3rd Edition, New Age International (p) Ltd, New Delhi, 2009.

UNIT – I : Chapter I – Sec 1.5 – Pg No – 49, 50
UNIT – II : Chapter II – Sec 2.1 – Pg No – 62 - 70
UNIT – III : Chapter II – Sec 2.2, 2.3 – Pg No – 70 to 77
UNIT – IV : Chapter II – Sec 2.4 – Pg No – 78-88
UNIT – V : Chapter II – Sec 2.5, 2.6– Pg No – 88-99

REFERENCES:

1. Feller W., An Introduction to Probability theory and its applications, Vol I & II Edition
2. Karlin S., and Taylor H.M., A first course in stochastic processes, Academic press, New York.

Elective -III **PROJECT** **Code: 173103607**

SEMESTER VI **5 Hrs/Week**

Credits 5

Students have to carry out Project works under the guidance of the members of the Mathematics department during VI Semester. Each batch may include 3 students. Project work may be chosen in any field of Mathematics CA each batch will complete the Project Work in the month of February and submit their report in March. It will be duly signed by the Project guide and HOD of Mathematics CA. The viva on Project work will be conducted at the end of VI Semester. The viva on project work will be conducted by the HOD, BOS and the course teacher.

Internal = 40 Marks	External = 60 Marks
Report = 30	Report = 50
Viva = 10	Viva = 10
Total = 40	Total = 60

Part IV **GRAPH THEORY** **Code: 174403631**
Skill Based Elective-VI **SEMESTER VI** **2 Hrs / Week**
Credits 2

Objective:

To provide the basic concepts about graphs and its types.

UNIT – I: **[6 Hrs]**

Introduction – Definition of a graph – Konigsberg Bridge Problem – Finite and Infinite Graphs – Incidence and degree – Isolated vertex – Pendent vertex – Null graph.

UNIT – II: **[6 Hrs]**

Isomorphism - Sub graphs – Edge disjoint Sub graphs – Vertex disjoint sub graphs – walks – paths – circuits

UNIT – III: **[6 Hrs]**

Connected graphs – Disconnected graphs - Components – Euler Graphs – Operation on Graphs.

UNIT – IV: **[6 Hrs]**

Trees – Properties of trees – Pendent vertices in a tree – Distance and centers in a tree.

UNIT – V: **[6 Hrs]**

Rooted and Binary trees – Spanning Trees – Fundamental Circuits – Finding all spanning trees of a graph

TEXT BOOK:

Narshing Deo, Graph theory with applications to Engineering and Computer Science, Premtice Hall of India Private Limited, New Delhi, 1994.

Unit 1: 1.1 to 1.5
Unit 2: 2.1, 2.2, 2.4
Unit 3: 2.5 to 2.7
Unit 4: 3.1 to 3.4
Unit 5: 3.5, 3.7 to 3.9

REFERENCES:

Dr. S. Arumugam and S. Ramachandran, Invitation to Graph theory, New Gamma Publications, Palayamkotai.

B.Sc MATHEMATICS with CA: Those who have joined from the academic year 2017–18 onwards under CBCS system

EVALUATION PATTERN

Internal : 25 Marks **External** : 75 Marks

INTERNAL:

Test – 20 (average of the better two of the three tests conducted)
Assignment – 5

Question Paper Pattern:

INTERNAL	EXTERNAL
Part – A : 6 × 1 = 6 (Multiple Choice)	Part – A :10 × 1 = 10 (Multiple Choice)
Part – B : 2 × 7 = 14 (Either /Or)	Part – B : 5 × 7 = 35 (Either /Or)
Part – C : 2/3 ×10= 20	Part – C : 3/5×10 = 30
*40	75

* Internal test mark 40 will be converted to 20.

SBE & NME

INTERNAL	EXTERNAL
Part – A : 3 × 1 = 3 (Multiple Choice)	Part – A :15 × 1 = 15 (Multiple Choice)
Part – B : 1 × 7 = 7 (Either /Or)	Part – B : 3/5 × 10 = 30
Part – C : 1/2 ×10= 10	Part – C : 2/4×15 = 30
20	75

The **Assignment** Component of any one of the subjects (except Non-Major Electives and other Department Papers) in the III and IV Semesters in UG COURSES (as decided by the Head of the Department on Rotation Basis) should be in the form of REPORT (as per the guidelines) on the **HANDS ON EXPERIENCE GAINED** by the students from their:

- Part-time job (or)
- Assignment (or)
- Self-Employment (or)
- Making of Hand made Products (or)
- Survey on Marketing of goods and services (or)
- Maintenance and Servicing of Equipments (or)
- How things Work (or)
- Working Principles of Toys/gadgets…. Models (or)
- Making of working Models using some Concepts

Students should maintain a work diary which should be monitored by the **course teacher** guided by a **Monitoring Committee** of the concerned department.