

DEPARTMENT OF MATHS WITH CA
Syllabus copy of the courses highlighting the focus on employability /
entrepreneurship / skill development
2015-16

CORE COURSE PROFILE
2016-17

| Se | Course Code | Course Title | Credits | Hrs/ cycle | L | T | P |
|-----|-------------|---|---------|---------------|---|---|---|
| I | MC16/1C/CAL | Calculus | 4 | 5 | 3 | 2 | 0 |
| | MC16/1C/PLC | Programming Language C (Theory) | 3 | 3 | 2 | 1 | 0 |
| | MC16/1C/PR1 | Programming Language C (Practical) | 1 | 2 | 0 | 0 | 2 |
| II | MC16/2C/TLT | Trigonometry and Laplace Transforms | 4 | 5 | 3 | 2 | 0 |
| | MC16/2C/C++ | Object Oriented Programming with C++(Theory) | 3 | 3 | 2 | 1 | 0 |
| | MC16/2C/PR2 | Object Oriented Programming with C++(Practical) | 1 | 2 | 0 | 0 | 2 |
| III | MC15/3C/ALS | Algebraic Structures | 4 | 5 | 3 | 2 | 0 |
| | MC15/3C/DEF | Differential Equations and Fourier Series | 4 | 5 | 3 | 2 | 0 |
| IV | MC15/4C/FDS | Fundamentals of Data Structures | 4 | 5 | 3 | 2 | 0 |
| | MC15/4C/VCG | Vector calculus and Coordinate Geometry | 4 | 5 | 3 | 2 | 0 |
| V | MC15/5C/RAN | Real Analysis | 4 | 5 | 3 | 2 | 0 |
| | MC15/5C/MEC | Mechanics | 4 | 5 | 3 | 2 | 0 |
| | MC15/5C/JAV | Programming in Java (Theory) | 3 | 6 | 2 | 4 | 0 |
| | MC15/5C/PR3 | Programming in Java(Practical) | 1 | 3 | 0 | 0 | 3 |
| | MC15/5E/DIM | Discrete Mathematics | 5 | 5 | 3 | 2 | 0 |
| | MC15/5E/OR1 | Operations Research-I | 5 | 6 | 3 | 3 | 0 |
| VI | MC15/6C/CAN | Complex Analysis | 4 | 5 | 3 | 2 | 0 |
| | MC15/6C/LAL | Linear Algebra | 4 | 5 | 3 | 2 | 0 |
| | MC15/6C/NTH | Number Theory | 4 | 5 | 3 | 2 | 0 |
| | MC15/6C/VIP | Visual Programming(Theory) | 3 | 6 | 2 | 4 | 0 |
| | MC15/6C/PR4 | Visual Programming (Practical) | 1 | 3 | 0 | 0 | 3 |
| | MC15/6E/OR2 | Operations Research-II | 5 | 6 | 3 | 3 | 0 |

SEMESTER – I

TRIGONOMETRY AND LAPLACE TRANSFORMS

Core – 1

Course Code: MC15/1C/TLT //MA15/1C/TLT

Teaching Hours: 75 hrs

Credits : 4

LTP : 3 2 0

OBJECTIVES:

To enable students to

- Know the principles and concepts of Trigonometry and Laplace Transforms
- Acquire the working knowledge in this course.
- Apply the concepts to other courses.

COURSE OUTLINE:

UNIT I : Expansion of $\sin nx$, $\cos nx$, $\tan nx$, $\sin^n x$, $\cos^n x$. Expansion of $\sin x$, $\cos x$, $\tan x$ in ascending powers of x (15 hrs)

Book 1 : Chap 3 - Sec 1,2,4,5.

UNIT II : Hyperbolic Functions: definition, relation between hyperbolic functions and Inverse hyperbolic functions (20 hrs)

Book 1 : Chap 4 - Sec 1,2.1,2.2,2.3

UNIT III: Logarithm of complex quantities (10 hrs)

Book 1 : Chap 5 - Sec 5 – 5.1,5.2.

UNIT IV: Summation of Trigonometric series by using complex quantities: $C+iS$ form, Gregory series (only simple problems in both the cases) (15 hrs)

Book 1 : Chap 6 - Sec 3.

UNIT V: Laplace Transform: Laplace Transform- Inverse Transform, properties. Application of Laplace Transform to solution of the first and second order Linear differential equations (with constant coefficients)

(15 hrs)

Book 3 : Chap 6

RECOMMENDED TEXT:

1. S. Narayan and T.K. Manicavachagom Pillay, Trigonometry
2. S. Narayan and T.K. Manicavachagom Pillay (2002), Calculus Volume –II, S.Viswanathan printers and publishers Pvt. Ltd, Chennai
3. P.R. Vittal (2004) Differential Equations and Laplace Transforms, Margham Publications, Chennai

REFERENCE BOOKS:

1. A.Singaravelu, Algebra and Trigonometry Volume (2003), Meenakshi Agency, Chennai
2. P.R. Vittal, Trigonometry, Margham Publications
3. P.R. Vittal(2004), Calculus, Margham Publications, Chennai
4. A.Singaravelu and R.Ramaa, Calculus and Co-ordinate Geometry of two dimension (Paper –II), Meenakshi Agency, Chennai

PERIODICALS:

The Mathematics Intelligencer.
Mathematics Newsletters

WEBSITES & e-LEARNING SOURCES:

<http://www.mathforum.org>

<http://www.opensource.org>

Question Paper Pattern

Question paper should cover all the five units.

| Component | Nature of the Question | Maximum Marks |
|------------------|---|----------------------|
| Section A | Short Answers (10X 2) | 20 Marks |
| Section B | Understanding Description /Problems (5 X 8) | 40 Marks |
| Section C | Application/ Analysis/ Synthesis/ Evaluation (2 X 20) | 40 Marks |

Section A: Short Answer: 10 Questions, 2 questions from each Unit, each carrying 2 marks

Section B: 5 questions to be answered out of 8 questions, each carrying 8 marks

Section C: 2 questions to be answered out of 4 questions, each carrying 20 marks.

SEMESTER – I
DIFFERENTIAL CALCULUS

Core - 2

Course Code: MC15/1C/DCL//MA15/1C/DCL

Teaching hours: 75 hrs

Credits: 4

LTP: 3 2 0

OBJECTIVES:

To enable students to

- Learn the principle and concepts of Differential Calculus
- Acquire the working knowledge in this course
- Apply the concepts to other courses

COURSE OUTLINE:

UNIT I: Successive Differentiation- n^{th} derivative, standard results – Leibnitz Theorem (without Proof) and its applications (18hrs)

Book 1 Chapter 3 Section 1.1 -1.6 & Section 2.1 -2.2

UNIT II: Jacobians – Maxima and minima of functions of two independent variables. Necessary and Sufficient conditions (without proof) – Lagranges method of undetermined multipliers (without proof) (17hrs)

Book 1 Chapter 8 Section 4, 4.1, 5
Book 2 Chapter 3 Section 3

UNIT III: Envelopes: Curvature – Circle, radius and centre of curvature, Cartesian formula for the radius of curvature. (12 hrs)

Book 1 Chapter 10 Section 1.1, 1.2, 1.3, 2.1-2.3

UNIT IV: Co-ordinates of the centre of curvature – Curvature- radius of curvature in polar Co-ordinates, p - r equations, Pedal equation of a curve (10 hrs)

Book 1 Chapter 10 Section 2.4, 2.6 - 2.8

UNIT V: Definition – Asymptotes parallel to the axis, oblique asymptotes, $F_n + F_{n-2} = 0$ form, Intersection of a curve with its asymptotes (proofs are not included)

Book 1 Chapter 11 Section 1 - 4 & Sections 6 - 7 (18 hrs)

RECOMMENDED TEXT:

1. S. Narayanan & T.K. Manickavachagom Pillay, Calculus Volume I (2004), S. Viswanathan Printers & Publishers
2. P.R. Vittal (2004), Calculus, Margham Publications

Reference Books :

Singaravelu, R. Ramaa, Calculus & co-ordinate geometry of 2 dimensions (Paper II), Meenakshi Agency, Chennai

PERIODICALS:

The Mathematics Intelligencer
Mathematics Newsletters.

WEBSITES AND E-LEARNING SOURCES :

<http://www.mathforum.org>

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| Section A | Short Answers (10 X 2) | 20 Marks |
| Section B | Understanding Description /Problems (5 X 8) | 40 Marks |
| Section C | Application/ Analysis/ Synthesis/ Evaluation (2 X 20) | 40 Marks |

Section A: Short Answer: 10 Questions, 2 questions from each Unit, each carrying 2 marks

Section B: 5 questions to be answered out of 8 questions, each carrying 8 marks

Section C: 2 questions to be answered out of 4 questions, each carrying 20 marks.

SEMESTER – I

PROGRAMMING LANGUAGE C (THEORY)

Core - 3
Teaching Hours: 60

Course Code: MC15/1C/PLC
Credits: 4 L T P: 3 1 0

OBJECTIVES:

- To introduce the concepts of programming language
- To enable the students to understand the basic concepts of c
- To develop the programming skills in c

COURSE OUTLINE:

UNIT I

About C – Introduction – importance – data types and variables – character set – C tokens – keywords – identifiers – constants – variables – Data types declaration – assigning values to the variables – operators and expressions – formatted input and output.

Section : 1.1,2.1 – 2.10, 3.1 – 3.12, 4.1-4.5. (15 hrs)

UNIT II

Control statements: decision making and looping – decision making and branching.

Section : 5.1 – 5.9, 6.1 – 6.5. (10 hrs)

UNIT III

Arrays: one and two dimensional arrays – initializing two dimensional arrays – strings – handling of character strings – declaring and initializing string variables – reading strings from the terminal – writing strings to screen – arithmetic operation on characters – string handling function.

Section : 7.1 – 7.7,8.1-8.8 (10 hrs)

UNIT IV

Functions: Defining, accessing – passing arguments to functions – specifying argument data types – the scope and life time of variables in functions – recursion. Pointers: Understanding pointer – accessing address of a variable – declaring and initializing pointer – accessing a variable through its point – points and arrays – pointers and character strings – pointers and functions .

Section : 9.1 – 9.19, 11.1 – 11.16. (15 hrs)

UNIT V

Structures: Structure definition giving values to members – structure initialization – arrays of structures – arrays within structures – pointers and structures. File Management in C: Introduction – Defining and opening a File-closing file - Input/output operations on file.

Section : 10.1 – 10.11, 12.1 – 12.4 (10 hrs)

RECOMMENDED TEXT:

Programming in ANSI C, Sixth edition, E. Balagurusamy (case study excluded), Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:

1. Programming in 'C', Schaum Series, Bryon S. Gottfried, 1998, Tata Mc-Graw Hill, New Delhi.
2. Let us C, Yashavant P. Kanetkar, BPB Publications.

PERIODICALS:

International journal of Computer science and Security
Mathematics Newsletters.

WEBSITES & e-LEARNING SOURCES:

<http://www.cscjournals.org>

<http://www.opensource.org>

Question Paper pattern

Unless and otherwise specified in the syllabus for each paper, the pattern of the question paper shall be as follows:

| Component | Nature of the Question | Maximum Marks |
|-----------|---|---------------|
| Part A | Short Answers (10 X 2 Marks) | 20 |
| Part B | Understanding Description /Problems (5 X 8 Marks) | 40 |
| Part C | Application/ Analysis/ Synthesis/ Evaluation (2 X 20 Marks) | 40 |

Part A: Short Answer: 10 Questions, two from each Unit

Part B: can have 5 questions to be answered out of 8 questions covering all the five units.

Part C: can have 2 questions to be answered out of 3 questions covering all the five units.

SEMESTER – I

PROGRAMMING LANGUAGE C - PRACTICALS

Core : 4

Teaching hours – 30 hrs

Course Code: MC15/1C/PR1

Credits: 1 L T P : 0 0 2

PRACTICAL PROGRAMS

Implement the following programming concepts using C

1. Control statements
2. Arrays and structures.
3. Functions
4. Pointers.
5. File handling

Three programs under each heading

RECOMMENDED TEXT:

Programming in ANSI C, Second edition, E. Balagurusamy(case study excluded),
Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:

1. Programming in 'C', Schaum Series, Bryon S. Gottfried, 1998, Tata Mc-Graw Hill,
New Delhi.
2. Let us C, Yashavant P. Kanetkar, BPB Publications.

PERIODICALS:

International journal of Computer science and Security
Mathematics Newsletters.

WEBSITES & e-LEARNING SOURCES:

<http://www.cscjournals.org>

<http://www.opensource.org>

Template

Duration – 3 hours.

Maximum marks – 100 (Internal 40 + External 60)

Practical Examination – 60 (2 x 30)

One Internal Examiner and one External Examiner to be appointed to conduct the practical examination.

**SEMESTER – I / II
NON MAJOR ELECTIVE
STATISTICS USING EXCEL**

Teaching hours: 30 hrs

Course Code: MA15 / 1N / SUE (or) MA15 / 2N / SUE //

MC15 / 1N / SUE (or) MC15 / 2N / SUE//

MC15 / 1N / SUEH (or) MC15 / 2N / SUEH

Credits: 2

LTP: 0 0 2

OBJECTIVES:

To enable students to

- Understand the basic concepts of collection, classification and tabulation of data.
- Find the measures of averages and dispersion for given data.
- Represent the various measures using MS Excel.

COURSE OUTLINE:

UNIT-I: DIAGRAMMATIC REPRESENTATION OF DATA

One – dimensional diagrams: – Simple bar diagram, multiple bar diagram, sub-divided bar diagram. Two – dimensional diagram: – Pie diagram.

(10 hrs)

UNIT-II: MEASURES OF AVERAGES

Simple arithmetic mean, Median, Mode (raw data & Discrete Series only).

(10 hrs)

UNIT-III: MEASURES OF DISPERSION

Range, Standard deviation, Variance (raw data & Discrete Series only).

(10 hrs)

(All the UNITs to be covered through practical sessions)

BOOKS RECOMMENDED:

R.S.N. Pillai & V. Bagavathi, Statistics, S.Chand& Company Ltd.

REFERENCE BOOKS:

1. P.R. Vittal, Mathematical Statistics, Margham Publications
2. S.P. Gupta Statistical methods, Sultan Chand & Sons publications

PERIODICALS:

1. The Mathematics Intelligencer
2. Mathematics NewsLetters.

WEBSITES AND e-LEARNING SOURCES:

<http://www.mathforum.org>

<http://www.opensource.org>

Question Paper Pattern

5 questions are to be answered carrying 10 marks each (Practical)

SEMESTER – II

CLASSICAL ALGEBRA

Core-5

Teaching Hours: 75 hrs

Course Code: MC15/2C/CLA//MA15/2C/CLA

Credits : 4

LTP : 3 2 0

OBJECTIVES:

To enable students to

- Learn topics like Matrices
- Learn the basic concepts in theory of numbers
- Learn the concepts of theory of equations

COURSE OUTLINE:

UNIT I: Summation of series using Binomial, Exponential, Logarithmic series

Vol 1 Chap 3 Sec 10 & Chap 4 Sec 3,9 (12 hrs)

UNIT II: Theory of Equations: Polynomial Equations – Relation between roots and coefficients – symmetric functions of roots, Formation of equation.

Vol 1 Chap 6 Sec 1-12 (18hrs)

UNIT III: Transformation of Equations, Reciprocal equations – Descartes' rules of signs, Approximation of roots of cubic equations by Horner's method .

Vol 1 Chap 6 Sec 15-17,24,30 (12hrs)

UNIT IV: Matrices: Symmetric – Skew- symmetric- Hermitian, Skew-Hermitian, Orthogonal and Unitary matrices, Cayley- Hamilton theorem (without proof), Finding the inverse of a matrix using Cayley-Hamilton theorem. Eigen Values and Eigen vectors – Similar matrices – Diagonalisation.

Vol 2 Chap 2 Sec 1-8,9,1,16 (15 hrs)

UNIT V: Theory of numbers: prime and composite numbers, decomposition into prime factors (without proof), Divisors of a positive integer 'n', Euler function $\phi(n)$, Formula for $\phi(n)$ (without proof), the higher power of a prime contained in $n!$, Congruence's, Fermat's and Wilson's theorem (without proof)- simple problems.

Vol 2 Chap 5 Sec 1,6-8,10-13,16,17. (18hrs)

RECOMMENDED TEXT:

1. T.K. Manicavachagam Pillay, T.Natarajan, K.S.Ganapathy, Algebra Volume – I & II, S.Viswanathan Pvt. Ltd,2008

REFERENCE BOOKS:

1. P.R.Vittal and V.Malini, Algebra and Trigonometry, Margam Publishers.
2. Singaravelu, Algebra and Trigonometry Vol I & II, Meenakshi Agency, Chennai.

PERIODICALS:

The Mathematics Intelligencer.
Mathematics Newsletters

WEBSITES & e-LEARNING SOURCES:

<http://www.mathforum.org>
<http://www.opensource.org>

Question Paper Pattern

Question paper should cover all the five units.

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|------------------|---|----------------------|
| Section A | Short Answers (10 X 2) | 20 Marks |
| Section B | Understanding Description /Problems (5 X 8) | 40 Marks |
| Section C | Application/ Analysis/ Synthesis/ Evaluation (2 X 20) | 40 Marks |

Section A: Short Answer: 10 Questions, 2 questions from each Unit, each carrying 2 marks

Section B: 5 questions to be answered out of 8 questions, each carrying 8 marks

Section C: 2 questions to be answered out of 4 questions, each carrying 20 marks.

SEMESTER – II

INTEGRAL CALCULUS AND FOURIER SERIES

Core – 4

Course Code: MC15/2C/ICF//MA15/2C/ICF

Teaching Hours: 75 hrs

Credits : 4 LTP : 3 2 0

OBJECTIVES:

To enable students to

- Learn the principles and concepts of Integral calculus and Fourier Series
- Acquire the working knowledge in this course.
- Apply the concepts to other courses.

COURSE OUTLINE:

UNIT-I : Integral Calculus:

Reduction formulae, $\int e^{ax} \cos bx \, dx$, $\int e^{ax} \sin bx \, dx$ -
 $\int \sin^m x \cos^n x \, dx$ (m, n being positive integers),
 $\int x^m (\log x)^n \, dx$, $\int \cos^m x \cos nx \, dx$, $\int \cos^m x \sin nx \, dx$, Bernoulli's formula
Calculus Vol II Chapter 1 Sec 1.3, 13.1 – 13.10 (15 hrs)

UNIT-II: Double integrals (Cartesian co-ordinates only), change of order of integration.
Calculus Vol II Chapter 5 Sec 2.1, 2.2 (15 hrs)

UNIT-III: Triple integrals, Application of multiple integrals in finding area and volume.
(Cartesian co-ordinates only)
Calculus Vol II Chapter 5 Sec 4,5.1 - 5.3 (15 hrs)

UNIT-IV: Beta and Gamma functions (applications to simple problems) (15 hrs)
Calculus Vol II Chapter 7 Sec 2.1 - 2.3, 3,4.

UNIT-V: Fourier Series:

Fourier series of periodic functions, Fourier series of odd and even functions,
Calculus Vol III Chapter 6 Sec 1-3 (15 hrs)

RECOMMENDED TEXT:

S. Narayan and T.K. Manicavachagom Pillay, Calculus Volume – II & III, S.Viswanathan Pvt. Ltd, 2008

REFERENCE BOOKS:

1. P. Kandasamy and K. Thilagavathi, *Mathematics for B.Sc.*, - Volume II – 2004, S.Chand & Co., New Delhi.
2. Apostol, T.M. *Calculus. Vol.I* (4th Edn.) John Wiley and Sons, Inc., New York.1991.

PERIODICALS:

The Mathematics Intelligencer.
Mathematics Newsletters

WEBSITES & e-LEARNING SOURCES:

<http://www.mathforum.org>
<http://www.opensource.org>

Question Paper Pattern

Question paper should cover all the five units.

| Component | Nature of the Question | Maximum Marks |
|-----------|---|---------------|
| Section A | Short Answers (10 X 2) | 20 Marks |
| Section B | Understanding Description /Problems (5 X 8) | 40 Marks |
| Section C | Application/ Analysis/ Synthesis/ Evaluation (2 X 20) | 40 Marks |

Section A: Short Answer: 10 Questions, 2 questions from each Unit, each carrying 2 marks

Section B: 5 questions to be answered out of 8 questions, each carrying 8 marks

Section C: 2 questions to be answered out of 4 questions, each carrying 20 marks.

Semester – II

OBJECT –ORIENTED PROGRAMMING WITH C++ (Theory)

Core - 7

Course Code : MC15/2C/C++

Teaching Hours: 60

Credits: 4 LTP: 3 1 0

OBJECTIVES:

- To introduce the concepts of object oriented programming
- To enable the students to understand the basic concepts of C++
- To develop the programming skills in C ++

COURSE OUTLINE:

UNIT – I

Procedure oriented programming, Object- oriented programming paradigm – Basic concepts of object- oriented programming – Benefits of OOP – Applications of OOP. Introduction to C++ - tokens, keywords, identifiers and constants, data types, variables, Operators, Manipulators, Expressions and their types .

Section : 1.3 - 1.6, 1.8 , 3.1 – 3.6, 3.14, 3.18, 3.20 (10 hrs)

UNIT – II

Functions in C++ - Main Function- function prototyping- Call by reference- return by references Inline functions – Functions overloading. Classes and objects- arrays within a class, arrays of objects- Friend functions

Section : 4.1 – 4.6, 4.10, 5.1 – 5.5, 5.9, 5.13, 5.15 (10 hrs)

UNIT- III

Constructors and destructors – Multiple constructors in a class – Constructor with Default arguments, Copy constructors- dynamic constructors – destructors- Operator overloading and Type conversions.

Section: 6.1, 6.2, 6.4, 6.5, 6.7, 6.8, 6.11, 7.1 - 7.9 (15 hrs)

UNIT- IV

Inheritance – Single inheritance – Multilevel inheritance- Multiple inheritance – Hierarchical inheritance- hybrid inheritance – virtual functions.

Section : 8.1-8.3, 8.5-8.8, 9.6 (10 hrs)

UNIT – V

Managing console I/O operations - Working with files – classes for file stream operators – Opening and closing a file -Command Line arguments.

Section : 10.1 – 10.5, 11.1 – 11.3, 11.10
(Case studies excluded in all the units)

(15 hrs)

Recommended text:

E.Balaguruswamy , Object Oriented Programming with C++,Tata McGraw- Hill ,Fifth edition

References:

1. Schaum’s outline of , “Fundamentals of computing with C++”John R.Hubbard
2. Herbert Schildt, The complete Reference C++, Tata McGraw – Hill
3. Robert Lafore Object – oriented Programming in Microsoft C++ ,Galgotia publications Pvt.ltd.

PERIODICALS:

The Mathematics Intelligencer
Mathematics Newsletters.

Websites and e-Learning Sources :

<http://www.cplusplus.com>
<http://www.opensource.org>

Question Paper pattern

Unless and otherwise specified in the syllabus for each paper, the pattern of the question paper shall be as follows:

| Component | Nature of the Question | Maximum Marks |
|-----------|---|---------------|
| Section A | Short Answers (10 X 2) | 20 Marks |
| Section B | Understanding Description /Problems (5 X 8) | 40 Marks |
| Section C | Application/ Analysis/ Synthesis/ Evaluation (2 X 20) | 40 Marks |

Part A: Short Answer: 10 Questions, Two from each Unit

Part B :can have 5 questions to be answered out of 8 questions covering all the five units.

Part C :can have 2 questions to be answered out of 3 questions covering all the five units.

SEMESTER – II

OBJECT –ORIENTED PROGRAMMING USING C++ - PRACTICALS

Core - 8

Teaching Hours: 30

Course Code: MC15/2C/PR2

Credit: 1 LTP: 0 0 2

1. Program to solve quadratic equations.
2. Program to implement If condition
3. Program to implement Looping concept
4. Program to demonstrate Function overloading.
5. Program to demonstrate operator overloading.
6. Program to demonstrate inheritance(Single, Multiple)
7. Design a program which reads a text from a file and to display the number of lines and number of words.
8. Program to copy the content of one file to another.

Recommended text:

E.Balaguruswamy , Object Oriented Programming with C++,Tata McGraw- Hill Publishing Co.Ltd, Fifth edition

References:

1. Schaum’s outline of , “Fundamentals of computing with C++”John R.Hubbard, Tata McGraw- Hill Publishing Co.Ltd.
2. Herbert Schildt, The complete Reference C++, Tata McGraw – Hill Publishing Co.Ltd.
3. Robert Lafore Object – oriented Programming in Microsoft C++ ,Galgotia publications Pvt.ltd.

PERIODICALS:

International journal of Computer science and Security
Mathematics Newsletters.

WEBSITES & e-LEARNING SOURCES:

<http://www.cscjournals.org>

<http://www.opensource.org>

Template

Duration – 3 hours.

Maximum marks – 100 (Internal 40 + External 60)

Semester Practical Examination – 60 (2 x 30)

One Internal Examiner and one External Examiner to be appointed to conduct the practical examination.

SEMESTER- I

BUSINESS MATHEMATICS

Elective: I (For I B.Com (Honors))

Course Code: MC15/1C/BMM

Teaching Hours : 90 Hours

Credits : 5 L T P : 3 3 0

OBJECTIVES :

This Paper aims to introduce and develop basic concepts of Mathematics.

UNIT – I : DIFFERENTIAL CALCULUS

Differentiation : Meaning , rules and interpretation of first and second order derivatives.

Applications of Differentiation : Elasticity of demand , total and marginal revenue , maxima and minima of univariate functions – applications of maxima and minima to economics only.

(20 HRS)

UNIT – II : ALGEBRA

Permutation and combination , Arithmetic Progression , Geometric Progression (20 HRS)

UNIT – III: ALGEBRA(CONTD)

Ratio ,Proportion and variations .

(20 HRS)

UNIT –IV: INTEGRATION

Integration : Meaning , rules of integration . Indefinite and definite integrals . Applications

(Integration by substitution and by parts (Trigonometric functions excluded)) (15 HRS)

UNIT – V: MATRICES

Matrices : meaning and operations – matrix inversions – solutions to linear equations – payroll wages and commission. (15 HRS)

RECOMMENDED TEXT:

1. Business Mathematics –P.R. Vittal

REFERENCE BOOKS:

1. Business Mathematics _ D.C Sancheti and V.K . Kapoor
2. Business Mathematics – B.M. Agarwal
3. Business Mathematics - R.S.Soni

PERIODICALS:

1. The Mathematics Intelligencer
2. Mathematics Newsletters

WEBSITES AND e-LEARNING SOURCES:

Question Paper pattern

| Component | Nature of the Question | Maximum Marks |
|-----------|---|---------------|
| Part A | Short Answers (10 X 2) | 20 Marks |
| Part B | Understanding Description /Problems (5 X 8) | 40 Marks |
| Part C | Application/ Analysis/ Synthesis/ Evaluation (2 X 20) | 40 Marks |

1.

Part A: Short Answer: 10 Questions, two from each Unit

Part B :can have 5 questions to be answered out of 8 questions covering all the five units.

Part C :can have 2 questions to be answered out of 3 questions covering all the five units

SEMESTER- III
CORE-5
ALGEBRAIC STRUCTURES

Teaching Hours: 75 hrs
Credits : 4

Course Code: MC15/3C/ALS
LTP : 3 2 0

OBJECTIVES:

To enable students to

- Understand algebraic concepts of groups and rings.
- Analyze and understand theorems on algebraic concepts.
- Apply the algebraic concepts in mathematical science.

COURSE OUTLINE:

- UNIT I:** Groups –subgroups. (15 hrs)
- UNIT II:** A counting principle –Normal subgroups –quotient groups. (15 hrs)
- UNIT III:** Homomorphism –Isomorphism- Automorphism - Cayley’s theorem. (15 hrs)
- UNIT IV:** Rings: Definitions- Examples - Some Special Classes of rings- Homomorphism- Isomorphism. (15 hrs)
- UNIT V:** Ideals and quotient rings-Maximal Ideals, Principal Ideals, Definition of Euclidean Ring, Unique Factorization Theorem (Theorem 3.7.2 only) (15 hrs)

RECOMMENDED TEXT:

I.N.Herstein (1989) Topics in Algebra(2nd edition) Wiley Eastern Ltd.
New Delhi.

- Chapter-2: Sec 2.1 to 2.9 (except applications 1 and 2 of section 2.7, Examples 2.8.1 & 2.8.2 and applications of section 2.9),
Chapter-3: Sec 3.1 to 3.5, 3.7 (definition and theorem 3.7.2 only)

REFERENCE BOOKS:

1. S. Arumugam, A.Thangapandi Issac, Modern algebra, New Gamma Publishing house, Palayamkottai.
2. K. Viswanatha Naik, Modern algebra, Emerald Publishers.

PERIODICALS:

The Mathematics Intelligencer.
Mathematics Newsletters.

WEBSITES & e-LEARNING SOURCES:

<http://www.mathforum.org>

Template

| Component | Nature of the question | Maximum marks |
|-------------|------------------------|---------------|
| Section –A | Description/Problems | 10x2=20 |
| Section – B | Description/Problems | 5x8=40 |
| Section - C | Description/Problems | 2x20=40 |

Section-A: Short Answer: 10 Questions, Two from each Unit.

Section-B: Can have 5 questions to be answered out of 8 questions covering all the five units.

Section-C: Can have 2 questions to be answered out of 4 questions covering all the five units.

SEMESTER – IV
CORE – 7
FUNDAMENTALS OF DATA STRUCTURES

Teaching Hours : 75hrs
Credits : 4

Course Code: MC15/4C/FDS
L T P : 3 2 0

OBJECTIVES:

- To introduce the basic concepts of Data structures.

COURSE OUTLINE:

UNIT I: Data Structures: Definition of a Data structure – Data structure operations- primitive and composite Data Types, Arrays-Linear Arrays-Representation of Linear Array in Memory-Traversing Linear Array-Inserting and Deleting in Linear Arrays (15 hrs)

UNIT II: Linked list-Representation of Linked lists in Memory-Insertion into a linked list-Deletion from a linked list. (15 hrs)

UNIT III: Stack- Array representation of stack-Linked representation of Stack- Application of Stack (infix to postfix conversion)-Queue-Linked representation of Queue. (15 hrs)

UNIT IV: Trees- Binary trees-Representing Binary tree in Memory-Traversing Binary trees. (15 hrs)

UNIT V: Graph_ Graph terminology- Sequential representation of graph: Adjacency matrix, Linked representation- Traversing a graph(Breadth First Search & Depth First Search) (15 hrs)

RECOMMENDED TEXT:

DATA STRUCTURES by SEYMOUR LIPSCHUTZ, Edition 2006,Tata McGraw-hill Publications.

REFERENCE BOOKS:

1. R. Kruse C.L. Tondo and B. Leung ,1997, Data Structures and Program design in C, PHI.
2. Cangsam,Augenstein, Tenenbaum,Data Structures using C & C++,PHI
3. D.Samantha,2005, Classic Data Structures, PHI,New Delhi.

WEBSITES AND E-LEARNING SOURCES

<http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-851-advanced-data-structures-spring-2012/> <http://ocw.mit.edu/index.htm>

Template

| Component | Nature of the question | Maximum marks |
|-------------|------------------------|---------------|
| Section –A | Description/Problems | 10*2=20 |
| Section – B | Description/Problems | 5*8=40 |
| Section-C | Description/Problems | 2*20=40 |

Section - A: Short Answer: 10 Questions, Two from each Unit

Section - B :Can have 5 questions to be answered out of 8 questions covering all the five units.

Section - C :Can have 2 questions to be answered out of 4 questions covering all the five units.

SEMESTER – V
CORE - 11
PROGRAMMING IN JAVA (THEORY)

Teaching Hours: 90 hrs
Credits : 3

Course Code: MC15/5C/JAV
L T P : 2 4 0

OBJECTIVES:

- To introduce the basic concepts of java
- To develop the programming skills in java
- To introduce the concepts of Applet and interface.

COURSE OUTLINE:

UNIT I: Introduction to java- Java features- Difference between java and C & Java and c++ , java and world wide web, Introduction to java language, Java program structure, java tokens, java statements, java virtual machine, command line arguments. (15 hrs)

UNIT II: Constants, variables, Data types, Type casting, getting values to variables, standard default values, operators and expressions, decision making and branching – if , if-else, nested if, elseif ladder, switch, ?: operator (20 hrs)

UNIT III: Decision making and looping – while, do, for, jumps in loops, labeled loops, classes, objects, and methods and strings. (20hrs)

UNIT IV: Interfaces, multiple inheritance, packages, putting classes together. (15 hrs)

UNIT V: Multi threading programming, managing errors and exceptions – Applet programming, graphic programming. (20hrs)

RECOMMENDED TEXT:

E. Balagurusamy , programming with java, second edition, Tata- McGraw-hill publishing co. Ltd.

REFERENCES:

1. Herbert Schildt , the complete reference java 5th edition , Tata- McGraw-hill publishing co. ltd
2. Y. Daniel ziang , an introduction to java programming, prentice – Hall of India Pvt. Ltd.

PERIODICALS:

International journal of Computer science and Security
Mathematics Newsletters.

WEBSITES AND E-LEARNING SOURCES:

<http://www.freejavaguide.org>

<http://www.java2s.com>

<http://www.opensource.org>

TEMPLATE

| Component | Nature of the question | Maximum marks |
|------------------|-------------------------------|----------------------|
| Section - A | Description/Problems | 10 x 2=20 |
| Section - B | Description/Problems | 5 x 8=40 |
| Section - C | Description/Problems | 2 x 20=40 |

Section - A: Short Answer: 10 Questions, Two from each unit

Section - B :Can have 5 questions to be answered out of 8 questions covering all the five units.

Section - C :Can have 2 questions to be answered out of 4 questions covering all the five units.

SEMESTER – V

PROGRAMMING IN JAVA - PRACTICAL

Teaching Hours: 45 hrs

Credits : 1

Course code: MC15/5C/PR3

L T P : 0 0 3

Implement the following programming concepts using Java

1. Classes and objects
2. Arrays
3. Multithreading
4. Exception handling
5. Inheritance
6. Applet programming

Two or three programs under each heading

RECOMMENDED TEXTS

E. Balagurusamy , programming with java, second edition, Tata- McGraw-hill publishing co. ltd.

REFERENCES:

1. Herbet Schildt , the complete reference java 5th edition , Tata- McGraw-hill publishing co. ltd
2. Y. Daniel ziang , an introduction to java programming, prentice – Hall of India Pvt. Ltd.

PERIODICALS:

International journal of Computer science and Security
Mathematics Newsletters.

WEBSITES AND E-LEARNING SOURCES:

<http://www.freejavaguide.org>

<http://www.java2s.com>

<http://www.opensource.org>

TEMPLATE

Duration- 3 hours

Maximum Marks- 100 (External – 60, Internal – 40)

Practical Examination- 60 (2 x 30)

One internal and one external should be appointed to conduct the examination.

SEMESTER – V
ELECTIVE - I
DISCRETE MATHEMATICS

Teaching Hours: 75 hrs
Credits : 5

Course Code: MC15/5E/DIM
L T P : 3 2 0

OBJECTIVES:

To enable students to

- Develop construction and verification of mathematical logic.
- Gain fundamental knowledge about lattices and Boolean Algebra.
- Learn the basics of Graph Theory and its application.

COURSE OUTLINE :

UNIT I : Propositional Calculus

Tautology and contradiction – Equivalence of formulae -duality law –
Tautological implications - Normal forms – disjunctive normal forms –
conjunctive normal forms. (15 hrs)

UNIT II : Lattices

Lattices - Introduction – Principle of duality - Properties of Lattices – sub
Lattice – distributive Lattice modular lattices – bounded lattice -
complemented lattice. (15 hrs)

UNIT III: Boolean Algebra

Definition – Other basic laws of Boolean Algebra – Principle of duality
for Boolean Algebras – ATOM definition - ATOMIC Boolean algebra –
Finite Boolean Algebra. Boolean expression – definition – Boolean
function – Literal – minterm and maxterm, Normal forms and Canonical
forms . (15 hrs)

UNIT IV: Graphs, Subgraphs And Connectedness

Introduction – definition and examples – degrees – subgraphs –
Isomorphisms – walks, trails and paths – connectedness and components –
blocks – connectivity. (15 hrs)

UNIT V: Eulerian And Hamiltonian Graphs

Introduction - Eulerian graphs – Hamiltonian graphs. (15 hrs)

RECOMMENDED TEXTS:

Unit I, II & III: Dr. S.P. Rajagopalan, Dr.R. Sattanathan, Discrete Mathematics,
Margham Publications, Chennai -17, 2011

Unit IV & V : S.Arumugam, S.Ramachandran: Invitation to graph theory, Scitech
Publications (India) Pvt.ltd, Chennai -17, 2001.

REFERENCE BOOKS:

1. Trembley J.P and Manohar .R , “Discrete Mathematical Structures with Applications to Computer Science”, Tata Mcgraw – Hill Publication Co., limited, New Delhi, 2003.
2. Ralph.P. Grimaldi, “Discrete and Combinatorial Mathematics: An Applied Introduction” 4th edition, Pearson Education Asia, Delhi 2002.

PERIODICALS:

The Mathematics Intelligencer
Mathematics News Letter.

WEBSITES AND e-LEARNING SOURCES:

[http:// www.mathfourm.org](http://www.mathfourm.org)

[http:// www.opensource.org](http://www.opensource.org)

TEMPLATE

| Component | Nature of the question | Maximum marks |
|------------------|-------------------------------|----------------------|
| Section –A | Description/Problems | 10 x 2=20 |
| Section – B | Description/Problems | 5 x 8=40 |
| Section-C | Description/Problems | 2 x 20=40 |

Section - A: Short Answer: 10 Questions, Two from each Unit

Section - B: Can have 5 questions to be answered out of 8 questions covering all the five units.

Section - C: Can have 2 questions to be answered out of 4 questions covering all the five units.

SEMESTER – V
ELECTIVE - 2
OPERATIONS RESEARCH - I

Teaching Hours: 90 hrs
Credits : 5

Course Code: MC15/5E/OR1
L T P : 3 3 0

OBJECTIVES:

- To develop computational skills
- To develop logical thinking in formulating industry oriented problems
- To apply these techniques in real life situations

COURSE OUTLINE :

UNIT I: Linear programming: General LPP- Mathematical formulation-Solution for LPP By Graphical Method and Simplex Method (finite optimal solution, unbounded solution, alternative optimal solution)- slack and surplus variables – solution for LPP with unrestricted variables (20hrs)

UNIT II: Artificial Variable Technique- Big-M Method (Charner's Penalty Method) – Concept of Duality- Dual theorem only statement- Reading solution from the dual from the final simplex table of the primal and vice-versa (20hrs)

UNIT III: Transportation problems: Mathematical formulation- North-West corner Rule - Least cost Method- Vogel's approximation method- Optimality test (15 hrs)

UNIT IV:

Assignment problems: Hungarian method of solving an assignment problem – Unbalanced assignment problems – Traveling Salesman (routing) problem (15hrs)

UNIT V: Game theory: Two persons zero sum games, the maxmin- minmax principle, saddle point and value of games, games without saddle points, mixed strategies, Dominance property, graphical method for $2 \times n$ or $m \times 2$ games (20 hrs)

RECOMMENDED TEXTS:

1. R.K. Gupta, Operations Research, Krishna Prakash
2. Gupta P.K & Hira D.S ,Problems in Operations Research, S.Chand & Co, Delhi
3. S.D. Sharma, Operations Research, Kedhar Nath Ram Nath & co, Meerut

REFERENCE BOOKS:

1. Taha, Operation Research, Printice Hall, New Delhi.
2. V.Sundaresan, K.S. Ganapathy Subramanian, & K.Ganesan, Resource Management Techniques (Operations Research), A.R. Publications, Nagapattinum District .
3. Kalavathy , Operations Research Vikas Publishing House Pvt .Ltd.

PERIODICALS:

The Mathematics intelligencer

Mathematics Newsletter

WEBSITES & E- LEARNING SOURCES:

<http://www.mathforum.org>

<http://www.opensource.org>

Template

| Component | Nature of the question | Maximum marks |
|------------------|-------------------------------|----------------------|
| Section –A | Description/Problems | 10 x 2=20 |
| Section – B | Description/Problems | 5 x 8=40 |
| Section-C | Description/Problems | 2 x 20=40 |

Section – A: Short Answer: 10 Questions, Two from each unit

Section – B : Can have 5 questions to be answered out of 8 questions covering all the five units.

Section – C : Can have 2 questions to be answered out of 4 questions covering all the five units.

SEMESTER – VI
CORE - 15
VISUAL PROGRAMMING (THEORY)

Teaching Hours : 90 hrs
Credits : 3

Course Code : MC15/6C/VIP
L T P : 2 4 0

OBJECTIVES:

- To enable the students to learn a high level language
- To introduce the basic concepts of visual programming
- To enable the students to develop the programming skills.

COURSE OUTLINE:

UNIT I : Introduction, Data base management, Invoking access, opening an existing file, creating a new object from the database management, creating a new table, creating tables by using wizard, modify the table design, creating table by entering data, creating table in design view, data types, field names, field properties, entering data, Database concepts (20 hrs)

UNIT II: Visual basic screen, tool bars, tool box, customizing a form, and writing simple programs, creating controls, text boxes, navigating between controls, message boxes. (15 hrs)

UNIT III: Anatomy of visual basic application, editing tools, statements, variables, data types, strings, displaying information on a form, picture boxes, rich text boxes, printer object, controlling program flow. (20 hrs)

UNIT IV: Built – in functions, functions and procedures, finishing the interface. (15 hrs)

UNIT V: Introduction to programming with database objects, methods and events for data control, monitoring changes to the database transaction control, data form wizard, building activex controls. (20 hrs)

RECOMMENDED TEXT

1. Ananthi sheshasaayee and sheshasaayee . Computer Applications in Business and Management, Margham publications
2. Gary cornell. Visual basic 6 from the ground up. Tata Mc Graw Hill -1999.

REFERENCE BOOKS:

Noel jerke. Visual Basic 6 (The complete reference) Tata Mc Graw Hill.

PERIODICALS:

International journal of Computer science and Security
Mathematics Newsletters.

WEBSITES AND E-LEARNING SOURCES :

<http://www.vbtutor.com>

<http://www.vbb.us>

TEMPLATE

| Component | Nature of the question | Maximum marks |
|-------------|------------------------|---------------|
| Section –A | Description/Problems | 10 x 2=20 |
| Section – B | Description/Problems | 5 x 8=40 |
| Section-C | Description/Problems | 2 x 20=40 |

Section – A: Short Answer: 10 Questions, Two from each Unit

Section – B : Can have 5 questions to be answered out of 8 questions covering all the five units.

Section – C : Can have 2 questions to be answered out of 4 questions covering all the five units.

SEMESTER VI

VISUAL PROGRAMMING (PRACTICALS)

Teaching Hours: 45
Credits : 1

Course Code: MC15/6C/PR4
LTP : 0 0 3

PRACTICAL PROGRAMS

1. Calculator
 2. String manipulation
 3. File selection
 4. Animation
 5. Calendar
 6. Shapes
- Creation of data base using a menu driven program for the following
7. Student details
 8. Pay roll processing
 9. Mark sheet processing

RECOMMENDED TEXTS

1. Ananthisheshasaayee and Sheshasaayee, Computer applications in Business and management, Margham publications.
2. Gary Cornell, Visual basic 6 from the ground up , Tata McGraw Hill- 1999

REFERENCE TEXTBOOK

Noel jerke, Visual basic 6(The computer reference) Tata McGraw Hill.

PERIODICALS:

International journal of computer science

WEBSITES AND e-LEARNING SOURCES

<http://www.vbtutor.com>,
<http://www.vbb.us>.

TEMPLATE

Duration- 3 hours

Maximum Marks- 100 (External – 60, Internal – 40)

Practical Examination- 60 (2X30)

One internal and one external should be appointed to conduct the examination.

SEMESTER –VI
ELECTIVE - 3
OPERATIONS RESEARCH-II

Teaching Hours: 90 hrs
Credits :5

Course Code: MC15/ 6E/OR2
L T P : 3 3 0

OBJECTIVES:

- To develop computational skills
- To develop logical thinking in formulating industry oriented problems
- To apply these techniques in real life situations

UNIT I: Inventory theory: Introduction- variables in an inventory problem - Need of inventory- Inventory problems - Advantages and disadvantages of inventory- Classification of inventory Models - Economic lot size models

Model I: Economic lot size model with uniform rate size demand, infinite rate of production and no shortages

Model II: Order level model with Uniform rate of demand (Q to be fulfilled in constant time) infinite rate of production and having shortage to be fulfilled. (15 hrs)

UNIT II : Model III: The general single period model of profit maximization with time independent cost - Discrete case only.

Model IV: Purchase Inventory model with – one price break – two price breaks. (derivation excluded), Newspaper boy problem (no derivation) problems only. (20 hrs)

UNIT III: Queuing theory- General concepts and definitions- classification of queues- Poisson process, Models

i (M/M/1) : (∞ / FCFS)

ii (M/M/1) : (N/ FCFS)

iii (M/M/S) : (∞ / FCFS) (15 hrs)

UNIT IV:Network Analysis:

Introduction- network diagram representation - rules for drawing Network diagram- labeling: Fulkerson's 'I-J' rule- time estimates and critical path - In Network analysis- Forward pass, Backward pass computation- Determination of floats and slack times- Determination of critical path. (15 hrs)

UNIT V: Project Evaluation and Review Techniques (PERT): optimistic time- most likely Time - Pessimistic time- expected time-variance- Rules for finding variance of events problems in PERT

(25 hrs)

RECOMMENDED TEXTS:

1. R.K. Gupta, Operations Research, 12th edition, Krishna Prakash
2. Gupta P.K & Hira D.S (2000) Problems in Operations Research, S.Chand & Co, Delhi
3. S.D. Sharma, Operations Research, 8th edition , Kedhar Nath Ram Nath & co, Meerut

REFERENCE BOOKS:

1. Taha , , Operations Research, Printice Hall, New Delhi.
2. V.Sundaresan, K.S. Ganapathy Subramanian, & K.Ganesan, Resource ManagementTechniques (Operations Research), Reprint June 2002, A.R. Publications, Nagapattinum District.
3. Kalavathy .S, Operations Research Vikas Publishing House Pvt Ltd

PERIODICALS:

The Mathematics intelligencer
Mathematics Newsletter

WEBSITES & e- LEARNING SOURCES:

<http://www.mathforum.org>

TEMPLATE

| Component | Nature of the question | Maximum marks |
|-------------|------------------------|---------------|
| Section –A | Description/Problems | 10 x 2=20 |
| Section – B | Description/Problems | 5 x 8=40 |
| Section-C | Description/Problems | 2 x 20=40 |

Section – A: Short Answer: 10 Questions, Two from each Unit

Section –B : Can have 5 questions to be answered out of 8 questions covering all the five units.

Section – C : Can have 2 questions to be answered out of 4 questions covering all the five units.

