(Annexure H-7)

SYLLABUS

For

MASTER OF SCIENCE (MATHEMATICS) – FYIP
SEMESTER–I & II

Credit Based Continuous Evaluation Grading System
(CBCEGS)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA
JALANDHAR
(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATIONS OF FIVE YEARS INTEGRATED PROGRAMME

MASTER OF SCIENCE (MATHEMATICS) – FYIP
(Session 2024-25)

Credit Based Continuous Evaluation Grading System (CBCEGS)

MASTER OF SCIENCE (MATHEMATICS) – FYIP SEMESTER I										
Course Code	**Course Title**	**Course Type**	**Hours per week**	**Credit**		**Marks**				**Examination Time (in Hours)**
			L-T-P	**L-T-P**	**Total**	**Total**	**Ext.**		**CA**	
							L	**P**		
FMAL-1136	Programming Language - I	C	3-0-0	3-0-0	3	75	60	-	15	3
FMAP-1139	Programming Laboratory- I	C	0-0-2	0-0-1	1	25	-	20	05	3

MASTER OF SCIENCE (MATHEMATICS) – FYIP SEMESTER II										
Course Code	**Course Title**	**Course Type**	**Hours per week**	**Credit**		**Marks**				**Examination Time (in Hours)**
			L-T-P	**L-T-P**	**Total**	**Total**	**Ext.**		**CA**	
							L	**P**		
FMAL-2135	Object Oriented Programming C++	C	3-0-0	3-0-0	3	75	60	-	15	3
FMAP-2137	Programming Laboratory-II	C	0-0-2	0-0-1	1	25	-	20	05	3

MASTER OF SCIENCE (MATHEMATICS) – FYIP SEMESTER–I

Session 2024-25
Course Code: FMAL-1136
Programming Language - I

Course Outcome:

After passing course the student will be able to:
CO1: Articulate various kind of software and hardware used in computers.
CO2: Work with different set of operations in C programming.
CO3: Apply various control statements of C Programming Language for designing solutions to different real world problems.
CO4: Implement single and multidimensional arrays for representing complex data collections.

MASTER OF SCIENCE (MATHEMATICS) – FYIP SEMESTER–I

Session 2024-25
Course Code: FMAL-1136
Programming Language - I

Examination Time: 3 Hours

Max. Marks: 75
Theory: 60
CA: 15

L-T-P: 3-0-0
Credit: 3

Instructions for the Paper Setters:
Eight questions of equal marks (12 Marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

UNIT-I

Introduction to Computer Programming, Program Development life cycle, algorithms, flow chart, decision table & pseudo code.

UNIT-II

Introduction to C language, data types, Operators and Expression, Input/output Functions, Structured programming elements, Control statements: Branching, Jumping, Looping Arrays.

UNIT-III

Pointers, Functions: Inbuilt Functions, User defined Functions, Recursion, Storage Classes in C, dynamic memory management.

UNIT-IV

Strings, Structure and union, Reference variables, basics of searching and sorting techniques, file handling in C

References / Textbooks:

1. E. Balagurusamy, Programming in ANSI C, Tata McGraw-Hill (2002), 5th edition.
2. Stephen G. Kochan, Programming in C, Pearson Education (2015), 4th edition.
3. R.S. Salari, Application Programming in C, Khanna Book Publishing (2012), 4th edition.
4. Anshuman Sharma, Learn programming in C, Lakhanpal Publishers (2016), 7th edition.

MASTER OF SCIENCE (MATHEMATICS) – FYIP SEMESTER–I

Session 2024-25
Course Code: FMAP-1139
Programming Laboratory - I

Examination Time: 3 Hours

Max. Marks: 25
Practical: 20
CA: 05

L-T-P: 0-0-1
Credit: 1

Development of Computer Programs using C language for:

- Separation of odd and even numbers
- Summation of N Natural numbers
- Generating Fibonacci series
- Roots of quadratic and Cubic equations
- Evaluating various mathematical functions: exp(x), log(x), sin(x), cos(x) etc using Taylor series expansion
- Arranging numbers in ascending and descending orders
- Finding maximum/minimum of numbers, for matrix operations, determinants, and inverse of 3x3 matrix, elementary numerical methods and statistical methods.

MASTER OF SCIENCE (MATHEMATICS) – FYIP SEMESTER–I

Session 2024-25
Course Code: FMAL-2135
Object Oriented Programming C++

Course Outcomes:

After the completion of this course, the student will be able to:

CO1: Comprehend the concepts of Object-Oriented Programming Paradigm.

CO2: Identify the use of access specifiers and different types of constructors in class.

CO3: Apply function and operator overloading.

CO4: Comprehend different types of inheritance and polymorphism.

MASTER OF SCIENCE (MATHEMATICS) – FYIP SEMESTER–I

Session 2024-25
Course Code: FMAL-2135
Object Oriented Programming C++

Examination Time: 3 Hours **Max. Marks: 75**
Theory: 60
CA: 15

L-T-P: 3-0-0
Credit: 3

Instructions for the Paper Setters:
Eight questions of equal marks (12 Marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

UNIT–I

Getting Started: Introduction. A brief history of C++, Variable, Constant, Expression, Statements, Comments and keywords of C++.

Operator: Arithmetic, Relational, Logical, Assignment, Increment/Decrement, Conditional, Precedence of Operators. Data type, Type conversion, library function.

Input/ Output Statements: Inputting using cin and out putting using cout statements, Preprocessor directives.

Basic Program construction: A complete C++ program: invoking Turbo C++, naming your program, usingthe editor, saving your program, compiling and linking, running the program Errors: Compiler, linker and runtime.

Other IDE features: Compiling and linking, shortcut exiting from IDE, examining files, opening an existing file, DOS shell.

UNIT–II

Programming Paradigms: Introduction to the object oriented approach towards programming by discussing Traditional, Structured Programming methodology.

Objects & Classes: Object Definition, Instance, Encapsulation, Data Hiding, Abstraction, Inheritance, Messages, Method, Polymorphism, Classes.

Object Oriented Programming using C++: Characteristics of OOP, Overview of C++, Objects and Classes, Member functions and data, private & public, constructor & destructor, Constructor Overloading, Types of Constructors.

UNIT-III

Operator Overloading: Overloading unary operators, Overloading binary operators, Data conversion, Pit-falls operator overloading and conversion.

Function Overloading: Function Overloading, Default Arguments, Ambiguity in Function Overloading.

UNIT–IV

Inheritance: Concept of inheritance, Base & derived classes, Access Specifiers, Class Hierarchies, Types of Inheritance with examples.

Polymorphism: Virtual functions, friend functions, static function, this pointer, polymorphism, Types of Polymorphism with examples, Templates

References / Textbooks:

1. Herbertt Schildt, C++: The Complete Reference, Tata McGraw-Hill Education India, 4th Edition.
2. Bjarne Stroustrup, The C++ Programming Language, Addison – Wesley Professional (2013), 4th Edition
3. G.S. Baluja, C++ Program Design (w/CD), Khanna Book Publishing Company (2015), 2nd edition.
4. Stanley Lippman, Josee Lajoie, Barbara Moo, C++ Primer, Addison-Wesley Professional (2012), 5th edition.
5. Richard Johnsonbaugh and Martin Kalin, Object Oriented Programming in C++, Pearson Education (1999), 2nd Edition

MASTER OF SCIENCE (MATHEMATICS) – FYIP SEMESTER–I

Session 2024-25
Course Code: FMAP-2136
Programming Laboratory - II

Examination Time: 3 Hours

Max. Marks: 25
Practical: 20
CA: 05

L-T-P: 0-0-1
Credit: 1

Lab based on Object Oriented Programming C++ (FMAL-2135)