INTRODUCTION

The important aspect of the study to Introduce students to the discipline of computing and to the problem solving process. The module stresses on good program design, and programming styles, and structured program development using a high-level programming language. Some basic concepts in procedural abstraction, structured programming and top-down design with stepwise refinement will be introduced. Topics to be covered include: algorithm design process, program development/coding/debugging, programming concepts in a high-level language including program structure, simple data types and structured types, and various control structures (sequencing, loops, conditional, etc.), and linear data structures, such as arrays and linked-lists. The utility of recursion will also be highlighted using a variety of sorting algorithms. Laboratory work is essential in this course”. Special functions theory is well known in mathematics for its apparent multiplicity of tricks and devices needed to obtain information about the subject matter. A study of the transformation theory and properties of the generalized hyper geometric function enable one to derive the properties of a large class of Special functions in a unified manner.

The problems to be investigated are:

To study applications of Bessel polynomials in the time-domain synthesis problem.

To study of fractional kinetic equations and thermonuclear functions.

To derive new results in integrals and series expansions of the various generalized hypergeometric functions.

To study of astrophysical thermonuclear functions for Boltzmann-Gibbs statistics and Tsallis statistics involving generalized hypergeometric functions.

To study multiplication and transformation formulae involving generalized hypergeometric functions.

To study the distributional integral transforms based on new special functions.

To study of fractional integration operators based on special functions.

To study of a relationship between multivariable Laplace transform, multivariable Mellin transform and multivariable Hankel transform.

To study of two dimensional Weyl fractional calculus associated with Whittaker transform.

To study of convolution integral equation involving generalized hypergeometric functions.

To study of expansion formulae involving a basic analogue of generalized hypergeometric functions.
To study of fractional calculus of generalized hypergeometric functions.

To study of composition of fractional integral operators involving product of generalized hypergeometric functions and a general class of polynomials.

To study of general class of multivariate distribution involving generalized hypergeometric functions.

To determine double and multiple Fourier series involving generalized hypergeometric functions.

To investigate the velocity, stream line, path line, velocity potential, stream function, complex potential of steady and unsteady incompressible fluid through porous medium

We have evaluated fractional derivative formulae (FDF). The first involves the product of a general class of polynomials and the multivariable $I$-function. The another one of a general class of polynomials and two multivariables $I$ -functions and has been obtained with the help of the generalized Leibnitz rule for fractional derivatives. The FDF also involves the product of a general class of polynomials and the multivariable $I$-function but it is obtained by the application of the first FDF twice and it involves two independent variables instead of one. Two polynomials and the functions involved in all our fractional derivative formulae as well as their arguments which are of the type $x^{n} \prod_{i=1}^{s} x^{\sigma_{i}} + \alpha_{i}$ are quite general in nature. These formulae, besides being of very general character have been put in a compact form avoiding the occurrence of infinite series and thus making them useful in applications. Our findings provide interesting unifications and extensions of a number of (new and known) results. For the sake of illustration, we give here exact references to the results to the results (in essence) of six research papers [2, 3, 12, 13, 14, and 15] that follow as particular cases of our findings. In the end, we record a new fractional derivative formula involving the product of the Hermite polynomials and the product of $r$ different Whittaker functions as a simple special case of our first formula.