DEPARTMENT OF MATHEMATICS

B.Sc. MULTIDISCIPLINARY

SEMESTER: 3

DIFFERENTIAL EQUATIONS (MTMMIN303T / MTMCOR303T)

Students could identify a number of areas where the modelling process results in a differential equation.

They will learn what an ordinary differential equation (ODE) is, what it means by its solution, how to classify, what it means by an IVP and so on.

They will learn to solve ODEs that are in linear, separable and in exact forms and also to analyze
the solution.

They will realize the basic differences between linear and nonlinear ODEs and also basic results
that guarantees a solution in each case.

They will learn a method to approximate the solution successively of a first order IVP.

They will become familiar with the theory and method of solving a second order linear homogeneous and nonhomogeneous equation with constant coefficients.

They will learn to find out a series solution for homogeneous equations with variable coefficients near ordinary points.

Students will acquire the knowledge of solving a differential equation using Laplace method which is especially suitable to deal with problems arising in engineering field.

Students will learn the technique of solving partial differential equations using the method of separation of variables.

SEMESTER: 4

PROBABILITY THEORY & MECHANICS (MTMMIN404T / MTMCOR404T)

Calculate the expectation and moments of random variables.

Identify the applications of various moment inequalities.

Explain the concept of convergence and check for the of convergence of a given sequences of random variables.

Find the expressions for the characteristic function of a random variable and verify its properties.

Apply the various laws of large numbers to sequences of random variables.

Understand the force systems and draw free body diagram to analyze rigid body equilibrium.

Comprehend the principles of friction and solve engineering mechanics problems associated with frictional force.

Compute the centroid, first moment and second moment of an area Understand the concept of motion of particles and rigid bodies.

Determine rectangular components of a force.

Obtain the equivalent force – couple system of a given system.

Analyze the equilibrium state of a particle and rigid body.

Estimate the moment of inertia of composite area about centroidal or any arbitrary axis.

Determine the velocity and acceleration of a particle in rectangular and cylindrical coordinate systems and angular velocity of rigid bodies in general plane motion.