Advanced Engineering Mathematics (ME 501, 3-0-2-8)

July - November Semester, 2017

Instructors: Arnab Kumar De (Even Roll Nos., 1203), Deepak Sharma (Odd Roll Nos., 1G2)

Class timings: Mon 9-10 AM, Tue 10-11 AM, Wed 11 AM-12 Noon

Contents

1. Linear Algebra: matrices, vector space, elementary transformations, linear equations, eigenvalue, diagonalization, orthogonality

2. Vector Calculus: tensor and vectors, differential geometry, div-curl-grad, vector integral calculus

3. Ordinary Differential Equation: first order equations, linear second order equations, system of ODEs, Strum-Liouville problems, special functions

4. Integral Transform: Laplace transform, Fourier series, Fourier integral and transform

5. Partial Differential Equation: nature and properties of PDEs, wave equation, elliptic and parabolic equations, quasi linear and non-linear equations, separation of variables

Text book:

1. R. K. Jain and S.R.K Iyengar, *Advanced Engineering Mathematics*, Narosa Publishing House.
2. Erwin Kreyszig, *Advanced Engineering Mathematics*, Wiley.

References:

1. Gilbert Strang, *Linear Algebra*, Cengage learning.
2. David Poole, *Linear Algebra, A Modern Approach*, Cengage Learning.
3. Thomas and Finney, *Calculus and Analytic Geometry*, Narosa Publishing House.
4. S. L. Ross, *Differential Equations*, Wiley.

5. H. W. Brown and R. V. Churchill, *Fourier Series*, McGraw Hill.

6. Ronald N. Bracewell, *The Fourier Transform and Its Application*, McGraw Hill.

7. Bhaskar Dasgupta, *Applied Mathematical Methods*, Pearson.

Grading:

Mid-semester examination - 25%

End-semester examination - 50%

Quizes - 10%

Computational Assignments - 15%

Conduct:

1. Apart from the theoretical exercises, laboratory sessions are equally important.

2. A student will be debarred from appearing in the end-semester examination if his/her attendance falls below 75 percent. **There will be no exception** to it other than unavoidable situation(s) which has to be justified by producing a valid certificate.

3. There will be **Two (2) quizes**, level, procedure and prior declaration (or surprise!) will depend upon overall progress and readiness of the class. Exact dates of the same will be announced in advance, **there will be no make-up quiz**.