

# MAT 572- Advanced Engineering Mathematics I

<b>Course Code:</b>	MAT-572
<b>UTAA Credit (Theoretical-Laboratory hours/week):</b>	3
<b>ECTS Credit:</b>	6-0
<b>Department:</b>	Mechanical and Aeronautical Engineering
<b>Language of Instruction:</b>	English
<b>Level of Study:</b>	Graduate
<b>Offered Semester:</b>	Fall and Spring Semesters.

## Course Objectives

Provide graduate students with the advanced analytical methods. It will be bases for their research areas

## Course Content

Matrices and system of linear equations, eigenvalue problems, ordinary differential equations, series solution, special functions, partial differential equations: elliptic, parabolic and hyperbolic equations, separation of variables, Laplace transforms, Fourier transforms, Green's function, perturbation methods.

## Course Learning Outcomes

1-A sound understanding of the matrices and ability solve system of various algebraic equations.

2-A sound understanding of the important special functions and their use in the solution of engineering problems.

3-Ability to solve nonlinear ODEs via series solution methods.

4-Ability to employ the separation of variables to solve partial differential equations.