

# MA 563- Theory of Plates and Shells

<b>Course Code:</b>	MA-563
<b>UTAA Credit (Theoretical-Laboratory hours/week):</b>	3(3-0)
<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

To familiarize students with the basic concepts and principles of theory of plates and shells. Give an ability to solve the problems of plates and shells with various boundary conditions and loads. Give an ability to apply the energy and numerical methods on mechanical behavior of plates and shells. Give an ability to apply the knowledge of theory of plate and shells on engineering applications and design problems

## Course Content

Introduction to theory of plates. Bending of rectangle plates. Laterally loaded rectangular plates. Navier solution. Levy solution. Fundamental equations for circular plates. Circular plates under symmetrical and asymmetrical loads. Application of energy methods and numerical methods. Vibrations of plates. Introduction to thin elastic shell theory. Membrane theory of shells and bending theory. Cylindrical shells and shells in the form of a surface of revolution.

## Course Learning Outcomes

- 1-Calculate the problems of plates and shells with various boundary conditions and loads
- 2- the energy to problems involving plates and shells
- 3-Use numerical methods to problems involving plates and shells when exact solution is impossible or not effective
- 4-Analyze using theory of bending of shells