

**General Regulations for Master of Science Program in Applied Mechanics  
Mechanical Engineering Department, Sharif University of Technology**

The program leading to a master degree in Applied Mechanics comprises 29 credits with a maximum duration of 2 years:

A -	Compulsory Core Courses	6 Credits
B -	Compulsory Specialized Courses	9 Credits
C -	Elective Specialized Courses	6 Credits
D -	Seminar	2 Credits
E -	Thesis	6 Credits

**A - Compulsory Core Courses (6 credits)**

Course #	Course Title	Credits
<b>28031</b>	Advanced Mathematics I	3
<b>28033 or 28046</b>	Continuum Mechanics I or Advanced Dynamics	3

**B - Compulsory Specialized Courses:**

Base on their major field, students should take at lest three courses of their field (9 credits).

**Solid Mechanic Field (S):**

Course #	Course Title	Credits
<b>28036</b>	Elasticity I*	3
<b>28042</b>	Finite Element Method	3
<b>28059</b>	Advanced Composite Materials	3
<b>28583</b>	Plates And Shells Theory	3
<b>28593 or 28572</b>	Fracture, Fatigue and Creep or Fracture Mechanics	3

\*Those who choose this field must pass “ Elasticity I”

### Vibration And Dynamical Systems Field (V)

Course #	Course Title	Credits
28556	Modal Analysis	3
28368	Chaotic Dynamics	3
28574	Nonlinear Vibrations	3
28588	Variational Methods In Applied Mechanics	3
28049	Advanced Analytical Dynamics	3
28301/28302	Rotor Dynamics and Lab	3
28052	Advanced Mechanism Design	3
28558	Condition Monitoring	3
28579	Random Vibrations	3
28046	Advanced Dynamics	3
28049	Dynamical Systems	3
28593	Continuous Systems Vibration	3

### Control And Automation Field (C)

Course #	Course Title	Credits
28045	Advanced Automatic Control*	3
28019	Control Systems Design	3
28551	Mechatronics	3
28625	Optimal Control	3
28589	Fuzzy Control	3
28586	Robust Control	3
28599	Intelligence System Model & Control	3
28627	Stochastic Control	3
28595	Nonlinear Control	3

\*Those who choose this field must pass "Advanced Automatic Control"

### Design Field (D)

Course #	Course Title	Credits
28025	Optimal Design	3
28593 or 28572	Fracture, Fatigue and Creep or Fracture Mechanics	3
28019	Control Systems Design	3
28299	Optimization Methods	3
28539	Advanced Engineering Design	3
28550/28551	Mechatronics and Lab	4

### **Manufacturing Process Field (M)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
<b>28042</b>	Finite Element Methods I	3
<b>28536</b>	Machine Tools And Machinery	3
<b>28537</b>	Metal Forming	3
<b>28538</b>	Manufacturing Metallurgy	3

### **Biomechanics (B)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits</b>
<b>28873</b>	Basics of Biomedical Engineering	3
<b>28881</b>	Biomechanics of Bone Injuries	3
<b>28891</b>	Bio-instruments	3
<b>28897</b>	Occupational Biomechanics	3
<b>28904</b>	Musculoskeletal Biomechanics	3
<b>28905</b>	Robotic Surgery	3
<b>28907</b>	Spine Biomechanics	3

### **C- Elective Specialized Courses (6 Credits)**

Students should pass two additional graduate courses (6 credits) offered at the Department of Mechanical Engineering.

### **D. Seminar (2 credits)**

All students should take this course during their 2<sup>nd</sup> semester at the Department of Mechanical Engineering.

### **E. Thesis (6 credits)**

Students should submit their project proposal by the end of their 2<sup>nd</sup> semester. All proposals undergo peer review. Alternatively, students may pass six course credits rather than the thesis (course-based program).