

**TEXT BOOKS :**

1. Jain, Iyengar and Jain, "Numerical Methods for Scientific and Engineering Computations", 3<sup>rd</sup> ed., New Age Int, 2004.
2. T. Veerarajan and T. Ravichandran, "Theory and Problems in Numerical Methods", 5<sup>th</sup> ed., TMH, 1996.

**REFERENCE BOOKS :**

1. Rajaraman, "Computer Oriented Numerical Methods", 2<sup>nd</sup> Edition, 1990.
2. Grewal B.S., "Numerical Methods in Engineers and Science", 5<sup>th</sup> ed., Khanna Publishers, 1992.
3. Gupta C.B. and Vijay Gupta, "Introduction to Statistical Methods", 1<sup>st</sup> ed., Vikas Publishing, 2009

<b>II Year B.Tech. Mechanical Engg. II-Semester</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>To</b>	<b>C</b>
	-	-	1	1	1

**SR002 SEMINAR****Course Description & Objective:**

Seminar is offered as an opportunity for graduate students to broaden their knowledge beyond their specific area of research and/or studies. This is important at and beyond the graduate level where our activities are highly focused and specialized from a topical perspective.

<b>II Year B.Tech. Mechanical Engg. I- Semester</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>To</b>	<b>C</b>
	-	-	3	3	2

**ME209 STRENGTH OF MATERIALS AND METALLURGY LAB****Course Description & Objectives:**

*To familiarize and make the students to know how to obtain the mechanical properties like Tensile strength, hardness, Young's Modulus of various metals. To impart the practical knowledge of the subject Mechanics of Solids this is studying in the present semester. To learn and to gain experience in the preparation of metallographic specimens. To examine and analyze the microstructures of carbons steels, brass, cast irons. To understand the basic principles of optical microscopy. To measure the harden ability of mild steel samples*

**Course Outcomes:**

1. *By performing the Tensile test students get experience in drawing the Stress strain curve of the given material. With this graph, they can understand the salient features and properties of metals. They can also understand the difference between Ductile and brittle material.*
2. *By performing the Hardness test, students get the information of hardness property of given metals. With the Torsion test students can understand the importance of rigidness of metal in transmitting a torque by shafts. Students can also understand the importance of Torsion equation while designing a shaft problems.*
3. *By performing the Deflection test on beams students can understand the importance of bending equation of beams. Students can be able to calculate the Elastic limit of any material by conducting the simple and easy experiment on any beam.*
4. *After the completion of this laboratory course, the student is able to prepare the specimens for metallographic examination with best practice, can operate the optical microscope and understand, interpret, analyze the microstructures of materials.*

**Details of the Experiments :****STRENGTH OF MATERIALS**

1. Direct tension test
2. Bending test on
  - a) Simply supported beam
  - b) Cantilever beam
3. Torsion test
4. Hardness test
  - a) Brinells hardness test
  - b) Rockwell hardness test
5. Test on springs
6. Compression test on cube
7. Impact test

**METALLURGY:**

1. Preparation and study of the Micro Structure of pure metals like Iron, Cu and Al.
2. Preparation and study of the Microstructure of Mild steels, low carbon steels, high – C steels.
3. Study of the Micro Structures of Cast Irons.
4. Study of the Micro Structures of Non-Ferrous alloys.
5. Study of the Micro structures of Heat treated steels.
6. Hardenability of steels by Jominy End Quench Test.
7. To find out the hardness of various treated and untreated steels.