

AUPC2001 FUNDAMENTALS OF AUTOMATIVE DESIGN (3-0-0)

Module-I (6 Hrs.)

Basics of Automative Design - Classification of automative design, Introduction to design procedure, Stages in design, Engineering materials and their physical properties as applied to design, Selection of materials, Endurance limit and factors affecting it, Determination of endurance limit for ductile materials, Notch sensitivity, Fits and Tolerances, Principle of design optimization, Future trends, CAD. Types of loads, Modes of failure, factor of safety concepts, Theories of Failure, concept and mitigation of stress concentration, Fatigue failure and curve, Goodman, Gerber and Soderberg criteria. (Use of Data books)

Module-II (6 Hrs.)

Design of Joints - Rivets, welds and threaded fasteners based on different types of loading, cotter joints and knuckle joints.

Module-III (6 Hrs.)

Design of Keys and Shafts - Classification of keys and pins, Design of keys and pins
Shaft materials and design stresses, design of shafts on the basis of strength, design of shaft on the basis of rigidity, design of hollow shafts.

Module-IV (6 Hrs.)

Design of Bearings - Types of bearings, design of journal bearings, ball and roller bearings, types of roller bearings, bearing life, static load capacity, dynamic load capacity, bearing material, boundary lubrication, oil flow and temperature rise.

Module-V (6 Hrs.)

Design of Couplings and Springs - Introduction, types and uses design procedures for rigid and flexible rubber-bushed couplings.

Introduction to Design of Helical Springs Design of Helical Springs for Variable Load, Design of Leaf Springs.

Books:

- Design of Machine Elements, V. B. Bhandari, Tata McGraw Hill.
- Design of Machine Elements by C. S. Sharma and K. Purohit, PHI.
- Machine Design by R. K. Jain, Khanna Publishers, 1992.
- Machine Design, P. Kanaiah, Sciotech Publications.
- Machine Design, Pandya and Shah, Charotar Book Stall.
- Machine Design, Robert L. Norton, Pearson Education Asia.

Design Data Handbooks:

1. P.S.G. Design Data Handbook, PSG College of Tech Coimbatore.
2. Design Data Handbook, K. Lingaiah, McGraw Hill, 2nd Ed. 2003.
3. Design Handbook by S. M. Jalaluddin, Anuradha Agencies Publications.
4. Design Data Handbook by K. Mahadevan and B. Reddy, CBS Publishers.