Machine Design Project I

Course Number: MEng 3132 **Course Title:** Machine Design ProjectI	**Credit Hours:** 3 **Contact Hours**: 1 Lectures hr and 6 Tutorial

Course Objectives:

At the end of the course, students would be able to know:

- The different types of machine design methodologies,
- Design procedures of machinery and equipment,
- Specifications of machineries and equipment,
- Documentation of machine design reports.

Course Description:

Conceptual Design; Embodiment Design. Design procedures and special calculation methods related to the design projects; Practical design of typical machine assemblies; Simple machine units and elements; Design project: Unfired pressure vessels and jacks (Bottle, Scissor, Fiat Type, Service, etc.)

Course Outline:

Project work will be given after providing a discussion on machine design methodology and design procedures specific to the projects.

Pre-requisites: Machine Element I

Co-requisite:

Textbook:

References:

1. Avallon, E.A., *Marks' Standard Handbook for Mechanical Engineers*, Tenth Edition, MacGraw-Hill, 1997
2. Coulson and Richardson's , *Chemical Engineering Design*, Volume 6, Second Edition, Butterworth Heinemann, 1996
3. Gill, S.S., *The Stress Analysis of Pressure Vessels and Pressure Vessel Components*, Pergamon Press, 1970
4. Harvey, J.F., *Theory and Design of Pressure Vessel*, Second Edition, 1991
5. Hessen, H.C. and Rushton, J.H., *Process Equipment Design*, D. Van Nostrand Company, Inc., 1945
6. Joshi, M.V., and Mahajiani, V.V., *Process Equipment Design*, Third Edition, Macmillan, 2004
7. Juvinal, R.C., *Fundamentals of Machine Component Design*
8. Perry, R.H., *Chemical Engineering Hand Book*, Six Edition, 1984
9. Philips, A.L., *Welding Handbook*
10. Spence, J., and Tooth, A.S, *Pressure Vessel Design Concepts and Principles*
11. Smithells, *Metals Reference Book*, Seventh Edition, 1992

Teaching Methods:

- Project exercises with individual advising.

Project Work:

Project-I: Design of unfired pressure vessels (lateral support, saddle support, bottom legs, etc)

Project-II: Design of car jacks (scissor jack, bottle jack, etc.)

Attendance Requirement:

- Minimum of 75% attendance during lecture hours; and
- 100% attendance during project work sessions, except for some unprecedented mishaps.

Evaluation:

- Project-I 40%, and
- Project-II 60%.

Hours per-semester: 112 hrs