Instructor: Z. Pelin Bayındır (Office: IE 336, e-mail: bpelin@metu.edu.tr)

Lectures: To be announced.

Office hours: To be announced.

Catalog Description: The major difference between closed-loop supply chains and traditional (forward) supply chains is for a forward supply chain, the customer is at the end of the processes, and for a closed-loop supply chain there is a value to be recovered from the end-user. There are many different types of closed-loop supply chains in practice: production, distribution, commercial returns, repair/replacement, end-of-use/life closed-loop supply chains. The basic drivers for companies to consider closing their supply chains are legislation, environmental consciousness, profit, and customer expectations. Many closed-loop supply chains have a number of characteristics making their design, planning and control requirements different from those of traditional supply chains. Network design and operation, inventory and production planning and disassembly scheduling and sequencing are the fundamental issues for closed-loop supply chain design and operation.

Background Requirements: A basic foundation of optimization, probability theory, production and inventory planning.

Prerequisites: -

Textbook: There is no unique textbook. A number of journal papers will be used.

Other Reference Books:

Dekker, R., M. Fleischmann, K. Inderfurth, and L.N. Van Wassenhove (eds), *Reverse Logistics: Quantitative Models for Closed-Loop Supply Chains*, Springer, 2004.

Dyckho, H., R. Lackes, and J. Reese (eds),*Supply Chain Management and Reverse Logistics*, Springer, 2003.

Flapper, S.D.P, J.A.E.E. Van Nunnen, and L.N. Van Wassenhove (eds), *Managing Closed-Loop Supply Chains*, Springer, 2005.

Guide, Jr., V.D.R. and L.N. Van Wassenhove (eds), *Business Aspects of Closed-Loop Supply Chains*, Carnegie Mellon University Press, 2003.

Grading:(May change depending on the number of students enrolled)

Homework: 20%

Midterm Exam: 25%

Final Exam: 30%

Term Project: 25%

Tentative Course Schedule:

Week	Topic
1	Introduction to closed-loop supply chains
2	Classification of closed-loop supply chains
2	Strategic drivers for take-back,product and part recovery
3	Forecasting product returns
4	Collection and vehicle routing issues
5-6	Closed-loop supply chain network structures and design
7-10	Production/inventory planning models for part/product recovery
11-13	Reverse MRP Models, disassembly planning
13-14	Coordination, collaboration, competition issues