Eco 640: Study Guide
Part II: The Theory of the Firm

1. **The Production Technology of the Firm**

- The concepts of a firm, production, and production technology
- The notion of a production function
- An *isoquant* and the notion of factor substitution possibilities
- The Law of Diminishing Marginal Rate of Technical substitution
- An *isocost* line or equation
- Factors causing a shift or rotation of an isocost line.

2. **The Calculus of Cost Minimization: Optimal Input Combination**

- Cost minimization as constrained optimization problem
- The equi-marginal condition for least cost combination of inputs
- Output maximization as the dual problem of cost minimization

3. **The Cobb-Douglas Type Production Function and It Various Properties**

4. **Long-Run Production and Cost Analysis:**

- Returns to scale
- The expansion path
- The links among a firms production function, expansion path and long-run cost function
- Economies and diseconomies of scale

5. **Short-run Production and Cost Analysis**

- The dichotomy between short-run and long-run costs: Why in the short-run a firm may not be able to expand its output along its expansion path
- Families of short-run total costs (TFC, TVC, TC) and their interrelationships
- Families of short-run unit costs (AFC, AVC, ATC, MC) and their interrelationships
- The Law of Diminishing Marginal and Average Products
- Why marginal cost is not affected by fixed cost
- Returns to a variable input
- Relationships between average product and average variable cost and marginal product and marginal cost

6. **Profit Maximization and the Supply Curve of a Competitive Firm: Short-run**

- The equi-marginal condition for profit maximizing output in the short-run
- The equivalence of profit maximization and loss minimization
- A firm's decision to continue operating or shut-down in the short-run
- Identifying the short-run supply curve as a segment of the short-run marginal cost curve of a competitive firm
- Factors affecting the supply curve of a competitive firm
- The market supply curve of a competitive industry, short-run.

7. **The Theory of Marginal Productivity and The Demand for Factors of Production**

- The notion of marginal revenue product
- The marginal revenue product as the demand for labor of a competitive firm
- Factors affecting the demand for labor
- The demand for factor inputs in general

8. **Make sure you know the difference among the following cost concepts:**

- Explicit costs, implicit costs, and opportunity costs