Chapter 4

Lecture Notes

Chapter theme: Managers need to assign costs to products to facilitate external financial reporting and internal decision making. This chapter illustrates an **absorption costing approach** to calculating product costs known as **process costing**.

1

1. Comparison of job-order and process costing
   1. Similarities between job-order and process costing
      1. Both systems assign material, labor, and overhead costs to products and they provide a mechanism for computing unit product costs.

2

* + 1. Both systems use the same manufacturing accounts, including Raw Materials, Work in Process, Manufacturing Overhead, and Finished Goods.
    2. The flow of costs through the manufacturing accounts is basically the same in both systems.
  1. Differences between job-order and process costing
     1. Process costing is used when a single product is produced on a continuing basis or for a long period of time. Job-order costing is used when many different jobs having different production requirements are worked on each period.

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* + 1. Process costing systems accumulate costs by department and assign them uniformly to all units processed during the period. Job-order costing systems accumulate costs by individual jobs.

3

* + 1. Process costing systems compute unit costs by department. Job-order costing systems compute unit costs by job on the job cost sheet.

*Quick Check − process vs. job-order costing*

4-5

1. Cost flows in process costing
   1. Processing departments − An organizational unit where materials, labor, or overhead costs are added to the product.
      1. The activity performed in a processing department is performed uniformly on all units passing through it. Furthermore, the output of a processing department must be homogeneous.

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* + 1. Products in a process costing environment typically flow in a sequence from one department to another.

*Learning Objective 1: Record the flow of materials, labor, and overhead through a process costing system.*

7

* 1. The flow of materials, labor, and overhead costs
     1. The flow of costs through the manufacturing accounts is basically the same for process and job-order costing.

8

* + - 1. Direct materials, direct labor, and manufacturing overhead are added to Work in Process. When work in process is completed, the costs are transferred to Finished Goods. When finished goods are sold, the costs are transferred to Cost of Goods Sold.

8

* + 1. Nonetheless, there is a key fundamental difference between process and job-order costing systems.
       1. Job-order costing systems trace and apply manufacturing costs to jobs.

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* + - * 1. One Work in Process account is often used to accumulate costs for all jobs. The individual job cost sheets serve as a subsidiary ledger.
      1. Process costing systems trace and apply manufacturing costs to departments.
         1. A separate Work in Process account is maintained for each processing department.

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* + - * 1. Material, labor, and overhead costs transferred from one department’s Work in Process account to another department’s Work in Process account are called transferred-in costs.
    1. T-account and journal entry views of process cost flows (For purposes of this example, assume there are two processing departments—A and B).

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*Helpful Hint: Explain that the journal entries for job-order and process costing are similar, with the exception of the specific Work in Process account for each department under process costing.*

* + - 1. The flow of raw material costs.
         1. In T-account form:

Direct material costs are debited to the appropriate departmental Work in Process account depending upon where the materials were added to the production process. The Raw Materials account is credited for the corresponding amounts.

12

* + - * 1. In journal entry form:

Debit the respective departmental Work in Process accounts. Credit Raw Materials.

13

* + - 1. The flow of labor costs.
         1. In T-account form:

Direct labor costs are debited to the appropriate departmental Work in Process account depending upon where the labor was added to the production process. Salaries and Wages Payable is credited for the corresponding amounts.

14

* + - * 1. In journal entry form:

Debit the respective departmental Work in Process accounts. Credit Salaries and Wages Payable.

15

* + - 1. The flow of manufacturing overhead costs.
         1. In T-account form:

Manufacturing overhead costs are debited to the respective departmental Work in Process accounts. Manufacturing Overhead is credited by the corresponding amounts.

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Predetermined overhead rates are usually used to apply overhead to the departments.

* + - * 1. In journal entry form:

Debit the appropriate departmental Work in Process accounts. Credit Manufacturing Overhead.

17

* + - 1. The flow of manufacturing costs for partially completed units transferred from Department A to Department B:
         1. In T-account form:

The cost of direct materials, direct labor, and manufacturing overhead assigned to partially completed units from Department A is debited to Department B and credited to Department A.

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The transferred-in costs from Department A are added to the manufacturing costs incurred in Department B.

* + - * 1. In journal entry form:

Debit Work in Process − Department B and credit Work in Process − Department A.

19

* + - 1. The flow of manufacturing costs from the final processing department to finished goods.
         1. In T-account form:

Debit Finished Goods and credit Work in Process − Department B for the amount of the cost of goods manufactured.

20

* + - * 1. In journal entry form:

Debit Finished Goods and credit Work in Process − Department B.

21

* + - 1. The flow of manufacturing costs from Finished Goods to Cost of Goods Sold.
         1. In T-account form:

1. Debit Cost of Goods Sold and credit Finished Goods.

22

* + - * 1. In journal entry form:

Debit Cost of Goods Sold and credit Finished Goods.

23

1. Equivalent units of production
   1. Equivalent units − are defined as the product of the number of partially completed units and the percentage completion of those units.

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* + 1. Equivalent units need to be calculated because a department usually has some partially completed units in its beginning and ending inventories. These partially completed units complicate the determination of a department’s output for a given period and the unit cost that should be assigned to that output.

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*Helpful Hint: Explain that equivalent units simply restate the ending work in process inventory as if it were comprised of a smaller number of fully completed units.*

* + 1. Equivalent units − the basic idea.
       1. Two half completed products are equivalent to one complete product.

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* + - 1. 10,000 units 70% completed are equivalent to 7,000 complete units.

26-27

*Quick Check − calculating equivalent units*

* + 1. Equivalent units can be calculated two ways.
       1. The FIFO method is covered in the appendix.

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* + - 1. The weighted-average method is included within the main portion of the chapter and it is covered next.
  1. The weighted-average method of calculating equivalent units

*Learning Objective 2: Compute the equivalent units of production using the weighted-average method.*

29

* + 1. Characteristics of the weighted-average method:
       1. This method makes no distinction between work done in the prior and current periods. It blends together units and costs from the prior and current periods.

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* + - 1. The equivalent units of production for a department are the number of units transferred to the next department (or finished goods) plus the equivalent units in the department’s ending work in process inventory.
    1. Treatment of direct labor
       1. Direct labor costs are often small in comparison to the other product costs in process cost systems.

31

* + - 1. Therefore, direct labor and manufacturing overhead are often combined into one classification of product cost called conversion costs. The forthcoming example combines these costs.

32

* + 1. An example of the weighted-average method
       1. Assume that Smith Company’s Assembly Department reported activity for June as shown on this slide.

33

* + - 1. The first step in calculating the equivalent units is to identify the units completed and transferred out of the department in June (5,400 units for materials and conversion).

34

* + - 1. The second step is to identify the equivalent units of production in ending work in process with respect to materials for the month (540 units) and adding this to the 5,400 units from step one.

35

* + - 1. The third step is to identify the equivalent units of production in ending work in process with respect to conversion for the month (270 units) and adding this to the 5,400 units from step one.

36

*Helpful Hint: Explain that there will most likely be differences in the equivalent unit calculations between materials and conversion costs, as materials are usually added at the beginning of production, while conversion costs are added during the period.*

* + - 1. The equivalent units of production equals the units completed and transferred out (5,400 units) plus the equivalent units remaining in work in process (540 units for materials and 270 units for conversion).

37

* + - 1. A different visual depiction of the equivalent units calculation for materials is shown on this slide.

38

* + - 1. A different visual depiction of the equivalent units calculation for conversion is shown on this slide.

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*Helpful Hint: The treatment of beginning inventory under the weighted-average method often puzzles students, since work done in the prior periods is included in the equivalent units. Explain that this is called the weighted-average method precisely because it averages together beginning inventory and work performed in the current period. Costs and units are treated consistently. Both the equivalent units and the costs that go into the unit cost calculations under the weighted-average method include amounts already in beginning inventory.*

1. Compute and apply costs

*Learning Objective 3: Compute the cost per equivalent unit using the weighted-average method.*

40

* 1. Computing the cost per equivalent unit—weighted average method
     1. Assume the following additional facts with respect to Smith Company’s Assembly Department.

41

* + 1. The formula for computing the cost per equivalent units is as shown.

42

* + - 1. The numerators for Smith Company ($124,740 for materials and $85,050 for conversion) are computed as shown.

43

* + - 1. The cost per equivalent unit for materials ($21.00) and conversion ($15.00) is computed as shown.

44

* + - * 1. The equivalent units of production (5,940 for materials and 5,670 for conversion) were computed on a prior slide.
  1. Applying Costs—Weighted Average Method

*Learning Objective 4: Assign costs to units using the weighted-average method.*

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* + 1. Computing the cost of ending work in process inventory.
       1. The first step is to record the equivalent units of production in ending work in process inventory (540 units for materials and 270 units for conversion).

46

* + - 1. The second step is to record the cost per equivalent unit ($21.00 for materials and $15.00 for conversion).

47

* + - 1. The third step is to compute the cost of ending work in process inventory ($11,340 for materials, $4,050 for conversion, and $15,390 in total).

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* + 1. Computing the cost of units transferred out.
       1. The first step is to record the units transferred out to the next department (5,400 units for materials and conversion).

49

* + - 1. The second step is to record the cost per equivalent unit ($21.00 for materials and $15.00 for conversion).

50

* + - 1. The third step is to compute the cost of units transferred out ($113,400 for materials, $81,000 for conversion and $194,400 in total).

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*Learning Objective 5: Prepare a cost reconciliation report.*

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* + 1. Reconciling costs
       1. Computing the costs to be accounted for:

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* + - * 1. The first step is to record the cost of beginning work in process as shown on slide 43 ($10,039).
        2. The second step is to record the costs added to production during the period as shown on slide 43 ($199,751).
        3. The third step is to sum these two costs ($209,790).
      1. Computing the costs accounted for:
         1. The first step is to record the previously computed cost of ending working process inventory ($15,390).
         2. The second step is to record the previously computed cost of units transferred out ($194,400).

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* + - * 1. The third step is to sum these two costs ($209,790).
      1. Notice the two totals agree indicating that all costs have been accounted for.

1. Operation costing
   1. Operation costing is a hybrid of job-order and process costing because it possesses attributes of both approaches.
      1. Operation costing is commonly used when batches of many different products pass through the same processing departments.

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* + - 1. For example, similar to job-order costing, a shoe manufacturer may charge each batch of shoes for its own specific material costs (e.g., shoes made with expensive leather would be charged accordingly, as would shoes made with inexpensive synthetic materials).
      2. Similar to process costing, the shoe manufacturer may accumulate the labor and overhead costs by department and assign the same conversion cost per unit to each shoe regardless of the shoe style.

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