

Online Course Manual

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Module 2

<p style="text-align: center;">Table of Contents</p> <ul style="list-style-type: none">I. <u>Product Costing Systems</u>II. <u>Job-Order Costing System Entries</u>III. <u>Factory Overhead Account</u>IV. <u>Job Cost Sheets</u>VI. <u>Comprehensive Job-Order Illustration</u>	<p>Instructions:</p> <p>Click on any of the underlined titles in the table of contents to be directed to that section of the module. Click on the <back> symbol to return to the table of contents. Click on underlined words to be linked to the site that is referenced.</p>
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Module 2 Summary

I. *Product Costing Systems*

- A. As we explained in Module 1, manufacturers must be able to determine the cost of the inventory items they produce in order to price them accordingly, and costs often change frequently during the accounting period. Manufacturers must also have ready access to cost-related information in order to monitor and control the manufacturing process. For these reasons, manufacturing firms usually employ *perpetual* inventory systems.
- B. This module and the following module present two general ways in which perpetual inventory systems are used to accumulate costs. The entries in these two systems are similar to those presented in Module 1 in the “simplified illustration,” though some modifications must be made to make it possible to apply them in the real world. The two systems are:
1. ***Job-order cost systems*** can be used by companies that are able to divide their manufacturing operations into specific “jobs” or batches of production. Examples would include the manufacture of custom-built machines, construction of buildings, and so on. By using materials acquisition forms and labor time tickets, the exact labor and materials costs incurred in producing each job can be determined.
 2. ***Process cost systems*** (presented in Module 3) are used when the production process involves the flow of goods through various departments (processes). In these cases, costs cannot be recorded for any specific “batch” of production. Instead, the costs are accumulated by department and later averaged over all the units that are produced in the department. Examples would include the milling of flour, refining of gasoline, manufacture of paint, etc.
- C. Note that no matter which product costing system is used, the information it produces is crucial in controlling manufacturing operations, determining appropriate product selling prices, and preparing budgets for future operations.
- D. ***Job-Order Costing and Overhead.*** *Job-order* is a perpetual inventory method, and the entries made in job-order are very similar to the simplified illustration presented in Module 1. Once again, entries are made to the Materials, Work-in-Process, Finished Goods and Cost of Goods Sold accounts as units are started, completed and sold. Once again, we charge the units produced with direct materials, direct labor, and factory overhead costs. However, in the Module 1 example we pretended that the amount of factory overhead required to produce the units was known. In the “real world,” the actual total overhead costs will not be known with certainty until the end of the period. Therefore, in order to make it

feasible to record indirect overhead costs in a real-world situation, the overhead must be estimated and *applied* to production. This will cause a change in the way the entries for overhead costs are recorded.

1. A **Factory Overhead** account is maintained under the job-order system, and **when the actual overhead costs are incurred they are debited to it**. Note that the actual overhead costs will be recorded at various times during the period, and many of them will not be recorded at all until the adjusting entries are made at the end of the period. Here are some examples of entries made to record various overhead costs:

Factory Overhead	\$ X	
Materials Inventory		\$ X
<i>To record usage of indirect materials at various times</i>		

Factory Overhead	\$ X	
Wages Payable		\$ X
<i>To record indirect labor costs at various times</i>		

Factory Overhead	\$ X	
Cash		\$ X
Accumulated Depreciation		\$ X
Property Taxes Payable		\$ X
<i>To record cash payment of utilities costs and end-of period adjusting entries for plant asset depreciation and accrual of property taxes</i>		

2. **The Factory Overhead account is credited when it is time to apply overhead to production.** This is done throughout the period as batches of units are completed. Before we transfer them from Work-in-Process Inventory into Finished Goods Inventory, we must “cost” the units fully. At this time, the *Work-in-Process Inventory account is debited* for the overhead costs that are being applied, and the *Factory Overhead account is credited*:

Work-In-Process Inventory	\$ X	
Factory Overhead		\$X
<i>To apply estimated overhead cost to production</i>		

In addition to applying overhead to the units that are completed, we will also apply overhead cost to the units that are still in production at the end of the accounting period. We will do this so that the ending Work-In-Process Inventory will be properly costed. *Work-in-Process Inventory account is again debited* for the overhead costs that are being applied, and the *Factory Overhead account is again credited*:

Work-In-Process Inventory	\$ X
Factory Overhead	\$X
<i>To apply estimated overhead cost to the ending W-I-P inventory</i>	

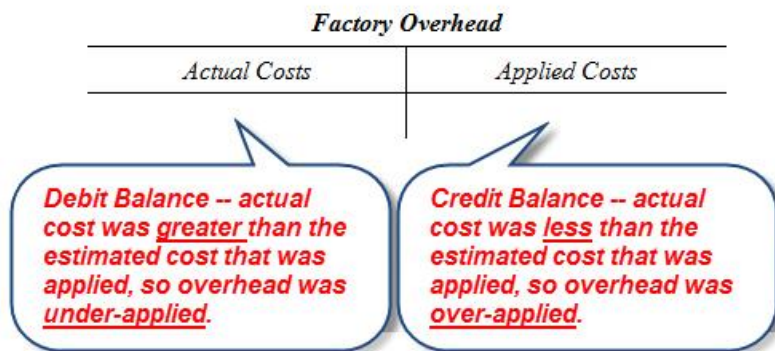
To summarize, **Factory Overhead is debited for actual costs incurred during the period and credited for the amount of estimated overhead that is applied to production:**

Factory Overhead	
<i>Actual Costs</i>	<i>Applied Costs</i>

3. **Why Use the Factory Overhead Account?** Under a perpetual inventory system, the cost of the units completed during the period must be removed from the Work-in-Process account and transferred into Finished Goods. *This occurs multiple times during the period as the units are completed, and before all the overhead costs have been recorded.* Therefore, while the direct materials and direct labor costs can be charged directly and accurately to the production, the indirect overhead costs cannot. How do we charge overhead costs, then, to production?
 - a. Since the actual overhead costs are not all known at the time the jobs are finished, it is necessary to *estimate* the overhead cost that was incurred to produce them.
 - b. Using the *predetermined overhead application rate* (see below), we estimate the overhead costs required to complete the job. We then *apply* this estimated amount to the job by debiting Work-In-Process and crediting Factory Overhead for the estimated overhead cost.
 - c. Note that the completed job has now been charged with the *actual* direct material and direct labor cost incurred in completing it, along with the *estimated* overhead cost. We know there will be some error in this amount because of the use of estimates, but it is still this total amount that is moved from Work-In-Process into the Finished Goods Inventory account.
 - d. Why do we debit *Factory Overhead* instead of *Work-In-Process* when we record actual overhead costs? Doing so isolates the overhead entries in a single account, and helps us measure the amount of the error in our estimate so that we can correct it!

If we (1) accumulate the actual costs as debits in the Factory Overhead account and then (2) credit the Factory Overhead account when overhead is applied to production, (3) the ending balance in Factory Overhead will equal the amount of the error in our estimated overhead cost.

For example, if there is no error in our estimate, the amount we apply to production will be exactly equal to the actual overhead cost incurred. In this case, the balance in Factory Overhead will be zero at the end of the period. If, however, we wind up with a debit balance in the account, we will know that more overhead was actually incurred than was applied (we will have *under-applied* the overhead). If we have a credit balance, we will know that more was applied than was actually incurred (overhead was *over-applied*). In both cases, the balance in Factory Overhead will be equal to the amount of our error. This makes it easier to measure the error and to then correct it.



- C . Remember, a debit balance remaining in the *Factory Overhead* account at the end of the period means that more cost was actually incurred than was applied, while a credit balance means more was applied than was actually incurred. Therefore, an end-of-period debit balance represents ***under-applied overhead cost*** while a credit balance represents ***over-applied overhead cost***. These errors are a normal and expected consequence of using estimates to apply the overhead.
- D. At the end of the period, any remaining balance in *Factory Overhead* must be removed.
1. Since a debit balance means that too little overhead was applied to production, it should be removed by crediting the Factory overhead account and debiting the account(s) that were not charged with the full amount of overhead cost incurred (namely, Work-In-Process, Finished Goods, and Cost of Goods Sold). However, if the amount is deemed to be immaterial, it is usually just debited to the *Cost of Goods Sold* account:

<i>Cost of Goods Sold</i>	\$ X	
<i>Factory overhead</i>		\$X

2. Conversely, a credit balance means that too much overhead was applied to production. It would be removed by debiting the *Factory Overhead* account and crediting the account(s) that were charged with too much overhead cost incurred. Again, if the amount is deemed to be immaterially small, it is usually just credited to the *Cost of Goods Sold* account:

<i>Factory overhead</i>	\$ X
<i>Cost of Goods Sold</i>	\$X

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- E. **More about overhead cost application.** As explained in Module 1, the overhead application rate is calculated by dividing the budgeted overhead for the period by an *application base* (also called an *activity base*, or *cost driver*). In Module 1 we used budgeted direct labor *hours* as our cost driver. In the example below, the application base is the estimated direct labor *cost* for the period. That application rate is calculated as follows:

$$\text{Predetermined Overhead Application Rate} = \frac{\text{Budgeted Overhead Cost}}{\text{Budgeted Direct Labor Cost}}$$

Remember, the application base should be something that is closely related to the overhead costs (i.e., something that “drives” them, or something that changes along with them). Since the overhead cost must be estimated and the application base must be estimated, the overhead application rate that is produced will be subject to error.

II. Comprehensive Job Order Cost System Journal Entries.

- A. This section illustrates the entries required to record manufacturing activity under a job-order cost system. You should compare these entries with those presented earlier in the simplified example in Module 1.
- B. **Purchases of supplies and materials.** When direct materials and supplies (indirect materials) are purchased, the *Materials Inventory* account is debited and *Accounts Payable* or *Cash* is credited:

<i>Raw Materials Inventory</i>	\$X
<i>Cash (Accounts Payable)</i>	\$X

To record purchase of raw materials and supplies.

- B. **Usage of supplies and materials.** When direct materials and/or supplies are requisitioned for use in manufacturing, the *Materials Inventory* account is credited and *Work In Process Inventory* is debited. If indirect materials are also used in production, then *Factory Overhead* is debited as well. Note that the direct materials costs would also be recorded on the individual job cost sheets.

Work in Process Inventory	\$X	
Factory overhead	\$X	
Raw Materials Inventory		\$X

To record use of direct materials and supplies

- C. **Recording labor costs.** Direct labor costs are charged to production by debiting *Work in Process Inventory* and crediting *Wages Payable* or *Cash*; any indirect labor costs recorded as part of the payroll must be recorded in the *Factory Overhead* account. The direct labor costs would also be recorded on the individual job cost sheets.

Factory Overhead	\$X	
Work in Process Inventory	\$X	
Wages Payable		\$X

To record Direct Labor

- D. **Recording actual overhead costs.** Recall that the *Factory Overhead* account will be debited as actual overhead costs are recorded during the period:

Factory Overhead	\$ X	
Cash, Accumulated Depreciation, etc.		\$X

To record actual overhead costs

- E. **Job Cost Sheets.** After the entries above have been made, the *Work in Process Inventory* account balance is equal to the cost of the direct materials and direct labor used in production during the period. The *Factory Overhead* account has been debited for the actual overhead costs incurred, so its balance equals the total overhead costs recorded so far during the period:

Work in Process Inventory	Factory overhead
Dir. Labor	Actual Overhead
Dir. Materials	

In addition to these general ledger accounts, a subsidiary ledger of **separate job cost sheets** are established for the jobs that are in process during the period. As the direct labor and materials costs are recorded in the *Work in Process Inventory* account, they are also recorded in the job cost sheets. Thus, the job cost sheets contain the direct labor costs and direct materials costs recorded for each job, and the total of these costs for all the jobs must equal the totals recorded in the *Work-in-Process Inventory* account.

Job Cost Sheet Subsidiary Ledger

Job #1		Job #2		Job #3	
Dir Material \$X	+	Dir Material \$X	+	Dir Material \$X	= Total Mtl.'s
Dir Labor \$X	+	Dir Labor \$X	+	Dir Labor \$X	= Total Labor
Balance \$X	+	Balance \$X	+	Balance \$X	= Total Cost
					= Bal. in WIP.

F. **Completing the jobs.** As jobs are completed, their costs must be fully determined in order to record their removal from the Work In Process Inventory account and placement into the Finished Goods Inventory account. This means that overhead must be applied to the jobs and that the Work in Process Inventory account must be debited for the total overhead costs that were applied. In addition, the job cost sheets must be updated. The amount of overhead to record is determined by using the predetermined overhead application rate. Assuming that jobs #1 and #2 are completed, the entry to record the application of overhead to them would be:

Work in Process Inventory \$ X
Factory overhead \$X
To apply overhead to completed jobs

The general ledger accounts and the job cost sheets now appear as follows:

Work in Process Inventory Control		Factory overhead	
Dir. Labor		Actual Overhead	Applied OH
Dir. Materials			
Applied OH			

Job #1		Job #2		Job #3	
Dir Materials \$X	+	Dir Materials \$X	+	Dir Materials \$X	= Total Mtl's
Dir Labor \$X	+	Dir Labor \$X	+	Dir Labor \$X	= Total Labor
Applied OH \$X	+	Applied OH \$X	+		= T. Applied OH
Balance \$X	+	Balance \$X	+	Balance \$X	= Total Cost
					= Bal. in WIP.

The job cost sheets for Jobs #1 and #2 may now be pulled from the subsidiary ledger for *Work in Process Inventory* and placed in the subsidiary ledger for *Finished Goods Inventory*. The following general journal entry is now made to record the removal of the total costs of jobs #1 and #2 from the *Work in Process Inventory* account and their transfer to *Finished Goods*:

<i>Finished Goods Inventory</i>	\$ X	
<i>Work in Process Inventory</i>		\$X
<i>To record completion of jobs</i>		

- G. When sales are made from the finished goods inventory it will be necessary to record the cost of the goods sold. Since the cost of the jobs has been calculated on the job cost sheet, it is only necessary to remove the sold job's cost sheet from the Finished Goods Inventory account subsidiary ledger, place it in the Cost of Goods Sold subsidiary ledger, and then make the following journal entry for the amount shown on the cost sheet:

<i>Cost of Goods Sold</i>	\$ X	
<i>Finished Goods Inventory</i>		\$X
<i>To record sale of job</i>		

- H. The company will proceed as outlined above through the remainder of the period, recording the purchase of materials, their use in production, the labor and overhead costs, and the completion and sale of jobs. At the end of the period it will be necessary to fully cost the jobs that have been started but not finished (those still in the *Work in Process Inventory* account subsidiary ledger cost sheets). The journal entry will be identical to that made to apply overhead to completed jobs, and it will again be necessary to update the job cost sheets. The amount recorded is again determined by using the predetermined application rate.

<i>Work in Process Inventory</i>	\$ X	
<i>Factory Overhead</i>		\$X
<i>To apply overhead to jobs in ending Work in Process</i>		

- I. The accounting process is now substantially complete. However, unless the estimates upon which the predetermined overhead application rate was based were perfect, the amount of overhead applied will have been either too great or too small. As explained in the previous section, a debit balance remaining in Factory Overhead represents under-applied overhead, while a credit balance represents over-applied overhead. The final entry will be to remove any remaining balance from the Factory Overhead account. Assuming the company decides it is appropriate to transfer the remaining balance directly to Cost of Goods Sold, the entry is:

Factory Overhead	\$ X	
Cost of Goods Sold		\$X
--or--		
Cost of Goods Sold	\$ X	
Factory Overhead		\$X

To record over- or under-applied overhead, and close the FOH account.

- J. Applications of product cost concepts to **service businesses**.
1. *For service businesses (consulting firms, doctor's practices, or accounting offices), the product "produced" is a service rather than a physical unit. Job-order costing can be applied in service as well as manufacturing businesses. For service businesses the direct labor cost of the professional providing the service can be traced directly to the work done for individual customers (the "jobs"), but other costs incurred in providing the service (called service costs instead of product costs) are indirect costs (called service overhead instead of factory overhead) that must be allocated in some logical way among the services provided*

 2. *Product cost concepts are still relevant and useful to the management of these businesses, since:*
 - a. *The cost of providing the service must be known in order to set service prices.*
 - b. *The costs incurred must be recorded and reported in a useful fashion on the income statement.*
 - c. *The costs of providing services must be analyzed and controlled in order to effectively manage the business.*

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A Job-Order Cost Illustration Problem
Journal Entries Required in a Job-Order Inventory System

The following is an illustration of manufacturing accounting journal entries, as they were presented above. The solution to the problem is also presented. You may want to practice by trying to do the problem before reviewing the solution. Note that the homework problems required in this module are similar to this problem and will be worked in a similar fashion. Required: M-3 Manufacturing Company begins operations on January 1. Record the following transactions using a perpetual job-order manufacturing inventory system then prepare the income statement and the closing entries.

- a. Began operations by purchasing \$10,000 of materials.
- b. Issued \$5,500 of materials to production. This was composed of \$1,000 of indirect materials (cleaning compounds) and \$4,500 of direct materials that were used in the manufacture of specialty jobs #1, #2, and #3. Made the journal entry and recorded costs in the job cost sheets as follows:

	<u>Job 1</u>	<u>Job2</u>	<u>Job3</u>
Cost of Materials Charged to Job:	\$2,000	\$1,500	\$1,000
c. Paid factory wages of \$50,000. This was composed of \$10,000 of indirect labor (janitor's wages) and \$40,000 of direct labor applied to the jobs. Made the journal entry and recorded costs in the job cost sheets as follows:			
	<u>Job 1</u>	<u>Job2</u>	<u>Job3</u>
Cost of Direct Labor Charged to Job:	\$20,000	\$15,000	\$5,000
d. Jobs #1 and #2 were completed and moved into the finished goods warehouse. Overhead is applied to production using a predetermined overhead application rate equal to 50% of direct labor cost. Recorded the application of overhead and the transfer of goods to Finished Goods Inventory. Posted all journal entries to the general ledger accounts.			
e. Job #1 was delivered to the customer who paid \$70,000. Recorded the sale and the cost of the goods sold.			
f. Recorded actual overhead costs incurred for the period as follows:			
Expired insurance on factory building			\$2,500
Accrued property taxes on building & equipment			\$1,200
Accrued supervisor salaries			\$3,000
Accrued utilities			\$1,300
Depreciation of building and equipment			\$3,000
g. Paid \$21,000 in operating expenses.			
h. Applied overhead to Job #3 in order to fully cost ending WIP inventory, and recorded necessary period-end entry to remove under- or over-applied overhead from the Factory overhead account. Posted all entries to the general ledger, and prepared the income statement. A physical count of the inventories produced valuation figures of \$4,500 for materials, \$8,500 for WIP, and \$24,000 for FG.			

(See below and following page for solution)



You may click the link below to play a video that illustrates and discusses the solution to the sample problem (solution begins on following page).

[Link to Job-Order Illustration – Part I](#)

[Link to Job-Order Illustration – Part II](#)

Solution to Job-Order Illustration Problem

a. Materials	10,000	
Cash or Accounts Payable		10,000
b. Work-in-Process	4,500	
Factory Overhead	1,000	
Materials		5,500
c. Work-in-Process	40,000	
Factory Overhead	10,000	
Cash		50,000
d. Work-in-Process	17,500	
Factory Overhead		17,500
Finished Goods	56,000	
Work-in-Process		56,000

Job Cost Sheet Subsidiary Ledger to Work-in-Process	
Job 1	
2,000	
20,000	
10,000	
<u>32,000</u>	
Job 2	
1,500	
15,000	
7,500	
<u>24,000</u>	
Job 3	
1,000	
5,000	
2,500	
<u>8,500</u>	

Work-in-Process	
4,500	56,000
40,000	
17,500	
2,500	
<u>8,500</u>	
Finished Goods	
56,000	32,000
<u>24,000</u>	
Cost of Goods Sold	
32,000	
2,000	
<u>34,000</u>	
Factory Overhead	
1,000	17,500
10,000	2,500
11,000	
<u>2,000</u>	

Job-Order Illustration Problem, Continued

e. Cash or Accounts Receivable	70,000	
Sales		70,000
Cost of Goods Sold	32,000	
Finished Goods		32,000
f. Factory Overhead	11,000	
Prepaid Insurance		2,500
Property Tax Payable		1,200
Salaries Payable		3,000
Utilities Payable		1,300
Accumulated Depreciation		3,000
g. Operating Expense	21,000	
Cash		21,000
h. Work-in-Process	2,500	
Factory Overhead		2,500
h. Cost of Goods Sold	2,000	
Factory Overhead		2,000

To remove underapplied overhead from Factory Overhead

Income Statement

Sales	70,000
Cost of Goods Sold	<u>(34,000)</u>
Gross Profit	36,000
Operating Expenses	<u>(21,000)</u>
Net Income	<u>15,000</u>

h. Sales	70,000	
Income Summary		70,000
Income Summary	55,000	
COGS		34,000
Operating Expenses		21,000
Income Summary	15,000	
Retained Earnings		15,000

-END-