

## Chapter 2

# Job-Order Costing for Manufacturing and Service Companies

### QUESTIONS

1. Manufacturing costs include all costs associated with the production of goods. Examples of manufacturing costs are: labor costs of workers directly involved with manufacturing goods, cost of all materials directly traced to products, indirect factory labor, indirect materials used in production, depreciation of production equipment, and depreciation of the manufacturing facility.

Nonmanufacturing costs are all costs that are not associated with the production of goods. These typically include selling costs and general and administrative costs.

2. Product costs are assigned to goods produced. Product costs are assigned to inventory and become an expense when inventory is sold. Period costs are not assigned to goods produced. Period costs are identified with accounting periods and are expensed in the period incurred.
3. Two common types of product costing systems are (1) job-order costing systems and (2) process costing systems.

Job-order costing systems are generally used by companies that produce individual products or batches of unique products. Companies that use job-order costing systems include custom home builders, airplane manufacturers, and ship-building companies.

Process costing systems are used by companies that produce large numbers of identical items passing through uniform and continuous production operations. Process costing tends to be used by beverage companies and producers of chemicals, paints, and plastics.

4. A job cost sheet is a form that is used to accumulate the cost of producing a job. The job cost sheet contains information on direct materials, direct labor, and manufacturing overhead related to a particular job.
5. Actual overhead is not known until the end of the accounting period. If managers used actual overhead rates to apply overhead to jobs, they would have to wait until the end of the period to determine the cost of jobs. In order to make timely decisions, managers need to know the cost of jobs before the end of the accounting period.

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6. An important characteristic of a good overhead allocation base is that it should be strongly related to overhead cost. Assume that setup costs are classified as manufacturing overhead. The number of setups that a job requires would be a better allocation base for setup costs than would the number of direct labor hours worked on that job. Number of setups is more closely related to setup costs than is the number of direct labor hours and, therefore, number of setups is a better allocation base.
7. In highly automated companies where direct labor cost is a small part of total manufacturing costs, it is unlikely that overhead costs vary with direct labor. Further, in such companies, predetermined overhead rates based on direct labor may be quite large. Thus, even a small change in labor (the allocation base) could have a large effect on the overhead cost allocated to a job.

Companies that are capital-intensive should consider using machine hours as an allocation base (or better still, they should consider the use of an activity-based costing system, which is discussed in more detail in Chapter 6).

8. It is necessary to apportion over- or underapplied overhead among Work in Process Inventory, Finished Goods Inventory, and Cost of Goods Sold accounts if the amount in the Manufacturing Overhead account is material whether a debit or credit balance. This assumes that the balances in Work in Process and Finished Goods are relatively large. If a company used a just-in-time systems and these balances were quite small, then it would be reasonable to just close over- or underapplied overhead to Cost of Goods Sold.
9. An unexpected increase in production would typically result in overhead being overapplied. Overhead is applied using a predetermined rate which equals estimated total overhead cost (including variable and fixed overhead) divided by the estimated level of the allocation base. Overhead applied equals the predetermined rate times the actual use of the allocation base. An unexpected increase in production means that the fixed component of the predetermined overhead rate will be multiplied by a larger number than anticipated. Thus, more fixed overhead will be applied than the company is likely to incur.
10. As companies move to computer-controlled manufacturing systems and greater use of robotics, direct labor will likely decrease (due to decreased need for workers) and manufacturing overhead will likely increase (due to higher depreciation costs associated with the computer-controlled systems).

**EXERCISES**

- E1. [LO 4]** Managers at Company A will perceive that overhead cost allocated to jobs increases with the amount of direct labor used. If they are evaluated on how well they control the cost of jobs, they will try to cut back on labor, which not only reduces labor costs but also overhead allocated to jobs they supervise. Following similar logic, managers at Company B will cut back on machine time and managers at Company C will make a special effort to control material costs (by reducing waste, searching for lower prices, etc). Note that the measure of performance (reduction in job costs) combined with the approach to allocating overhead drives managers to focus on different factors—this is a good example of “You get what you measure!”
- E2. [LO 5, 7]** If over- or underapplied overhead is large, we typically allocate it to Work in Process, Finished Goods and Cost of Goods Sold based on the relative balances in these accounts. However, if a company uses JIT, the balances in Work in Process and Finished Goods are likely to be quite small compared to the balance in Cost of Goods Sold. Thus, there will be only a small difference between assigning all of the over- or underapplied overhead to cost of goods sold versus apportioning it among the three accounts based on their relative balances.
- E3. [LO 4, 5]** The predetermined overhead rate at Precision Custom Molds is \$100 per direct labor hour ( $\$20,000,000 \div 200,000$ ). Given Job 525 has 25 direct labor hours, \$2,500 of overhead would be applied to it ( $\$100 \times 25$ ).
- E4. [LO 3]**
- |      |      |
|------|------|
| a. P | d. J |
| b. P | e. P |
| c. J | f. J |
- E5. [LO 1, 2]**
- |      |      |
|------|------|
| a. Y | e. N |
| b. N | f. Y |
| c. Y | g. Y |
| d. Y | h. N |

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- E6. [LO 2, 4]** Note that direct materials are charged to Work in Process Inventory while indirect materials are charged to Manufacturing Overhead.

Work in Process Inventory	200,000	
Raw Materials Inventory		200,000

Manufacturing Overhead	10,000	
Raw Materials Inventory		10,000

- E7. [LO 2, 4]** Note that direct materials are charged to Work in Process Inventory while indirect materials are charged to Manufacturing Overhead.

Work in Process Inventory	1,500	
Raw Materials Inventory		1,500

(250 + 350 + 400 + 500 = 1,500)

Manufacturing Overhead	100	
Raw Materials Inventory		100

- E8. [LO 2, 4]** Note that direct labor is charged to Work in Process Inventory while indirect labor is charged to Manufacturing Overhead.

Work in Process Inventory	70,000	
Wages Payable		70,000

Manufacturing Overhead	50,000	
Wages Payable		50,000

**E9. [LO 2, 4]**a. **Job No. 201**

110 hrs. × \$10/hr	\$1,100
90 hrs. × \$21/hr.	1,890
40 hrs. × \$12/hr.	<u>480</u>
Total	<u>\$3,470</u>

**Job No. 202**

50 hrs. × \$20/hr.	\$1,000
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**Job No. 203**

70 hrs. × \$18/hr.	\$1,260
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## b. Labor Report for the month of February (by job):

<b>Job</b>	<b>Time</b>		<b>Rate</b>	<b>Cost</b>
	<b>Ticket</b>	<b>Hours</b>		
201	2101	110	10.00	\$1,100
201	2102	90	21.00	1,890
201	2103	<u>40</u>	12.00	<u>480</u>
		<u>240</u>		3,470
202	2104	<u>50</u>	20.00	1,000
203	2105	<u>70</u>	18.00	<u>1,260</u>
			Total labor charges	<u>\$5,730</u>

Work in Process Inventory	5,730	
Wages Payable		5,730

**E10. [LO 5]**

- (1) Predetermined overhead allocation rate based on direct labor hours:  
 $\$900,000 \div 60,000 \text{ DLH} = \$15 \text{ per direct labor hour}$
- (2) Predetermined overhead allocation rate based on direct labor costs:  
 $\$900,000 \div \$1,800,000 = \$0.50 \text{ per dollar of direct labor}$
- (3) Predetermined overhead allocation rate based on machine hours:  
 $\$900,000 \div 30,000 \text{ machine hours} = \$30 \text{ per machine hour}$

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**E11. [LO 4, 5, 6]**

- a. The use of predetermined overhead rates makes it possible to cost jobs immediately after they are completed. If a company used an actual overhead rate, then job costs would not be available until the end of the accounting period. If Franklin Computer Repair charges customers based on actual job cost, it would be detrimental to customer service and company cash flows to have to wait until the end of the accounting period to bill customers.
- b. The overhead rate is:  
 $\$500,000 \div \$800,000 = \$0.625$  per dollar of technician wages.

$$\text{Total job cost} = \$200 + \$100 + (\$100 \times \$0.625) = \$362.50$$

**E12. [LO 4, 5]**

- a. Predetermined overhead rates:

<u>Allocation base</u>	<u>Predetermined Overhead Rate</u>
Direct labor hours	$\$1,000,000 \div 40,000 \text{ DLH} = \$25$ per direct labor hour
Direct labor cost	$\$1,000,000 \div \$625,000 = \$1.60$ per dollar of direct labor cost
Machine hours	$\$1,000,000 \div 20,000 \text{ MH} = \$50$ per machine hour
Direct material cost	$\$1,000,000 \div \$800,000 = \$1.25$ per dollar of direct material

- b. Cost of Job No. 253 using different allocation bases:

<u>Cost</u>	<u>DLH</u>	<u>DL cost</u>	<u>MH</u>	<u>DM cost</u>
Direct Materials	\$3,000	\$3,000	\$ 3,000	\$3,000
Direct labor	1,800	1,800	1,800	1,800
Manufacturing Overhead*	<u>3,750</u>	<u>2,880</u>	<u>7,500</u>	<u>3,750</u>
Total	<u>\$8,550</u>	<u>\$7,680</u>	<u>\$12,300</u>	<u>\$8,550</u>

\*Overhead rates in "a" above x actual activity.

**E13. [LO 2, 4, 5]**

- a. Overhead applied is equal to  $\$3 \times \$100,000$  of direct labor = \$300,000.

Work in Process Inventory	\$300,000	
Manufacturing Overhead		\$300,000

- b. Actual overhead is \$260,000

Manufacturing Overhead	260,000	
Raw Materials Inventory		40,000
Wages Payable		80,000
Utilities Payable		25,000
Accumulated Depreciation		60,000
Repairs Payable		55,000

**E14. [LO 5, 7]**

- a. Overhead applied is \$300,000 while actual overhead is \$260,000. Thus, Manufacturing Overhead has a \$40,000 credit balance. The journal entry to close the account to Cost of Goods Sold is:

Manufacturing Overhead	40,000	
Cost of Goods Sold		40,000

- b. Closing the balance in Manufacturing Overhead leads to product costs that are consistent with actual overhead costs rather than estimated overhead costs.
- c. Because Star Plastics uses a just-in-time inventory system, the balances in Work in Process and Finished Goods are likely to be quite small compared to Cost of Goods Sold. Thus, there is not likely to be a significant difference between charging the entire amount of overapplied overhead to Cost of Goods Sold versus apportioning it among Work in Process, Finished Goods and Cost of Goods Sold.

**E15. [LO 4, 5]**

Cost Summary: Job 325

Direct Material	\$10,000
Direct Labor (250 hours x \$16/hour)	4,000
Manufacturing Overhead:	
(\$25 per direct labor hour x 250 hours)	<u>6,250</u>
Total	<u><u>\$20,250</u></u>

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**E16. [LO 4, 5, 6]**

Estimated overhead = \$210,000 which is allocated based on cost of attorney and paraprofessional time.

Budgeted salaries:  $(5 \times \$100,000) + (9 \times \$50,000) = \$950,000$

Predetermined overhead rate =  $\$210,000 \div \$950,000 = \$0.22$  per dollar of attorney and paraprofessional time.

If client services require \$45,000 in salaries, then indirect costs assigned are:

$\$45,000 \times \$0.22 = \$9,900$ .

**E17. [LO 5]** Since the Manufacturing Overhead account has an ending credit balance (before adjustment), manufacturing overhead for the period is overapplied. The problem states that the balance is material—this suggests that we prorate the balance among Work in Process Inventory, Finished Goods Inventory, and Cost of Goods Sold.

<u>Accounts</u>	<u>Balance</u>	<u>% of Total</u>	<u>Total Overapplied</u>	<u>Adjustment</u>
Work in Process Inventory	\$ 500,000	25	\$90,000	\$22,500
Finished Goods Inventory	600,000	30	90,000	27,000
Cost of Goods Sold	900,000	45	90,000	40,500
Total	<u>\$2,000,000</u>			<u>\$90,000</u>

Manufacturing Overhead	90,000	
Work in Process Inventory		22,500
Finished Goods Inventory		27,000
Cost of Goods Sold		40,500

**E18. [LO 7]** Examples of negative events that would require a company holding inventory are as follows:

1. Strikes at a supplier would interrupt delivery of critical materials.
2. Unanticipated machine break-downs would interrupt production.
3. Natural disasters or terrorist attacks would interrupt the delivery of materials.

**E19. [LO 4]** Estimated manufacturing overhead was \$2,000,000 and eighty percent was fixed. When the sequence of material movements was changed and 30,000 of machine hours were saved, \$1,600,000 (80% of \$2,000,000) would remain unchanged. If variable manufacturing overhead is approximately \$4 per hour ( $\$400,000 \div 100,000$ ) the new variable portion would be \$280,000 ( $\$4 \times (100,000 - 30,000)$ ) which would make the total overhead about \$1,880,000. The savings is only \$120,000 or \$4 per hour, much less than \$20 per hour.



**E20.** *Student answers will vary. See below for possible ideas.*

One concept is the calculation of cost of goods manufactured and cost of goods sold. This concept is very important to someone who is an accountant for a manufacturing company. Accountants will need accurate information about direct materials, direct labor, and manufacturing overhead in determining the cost of manufactured products. From there, accountants can calculate the company's cost of goods sold. It is important for these numbers to be calculated correctly since an overstatement of cost of goods sold will lead to an understatement of net income and vice versa. Accountants have a responsibility to gather correct information and communicate this information to others who rely on it. Thus, accountants must make sure that accurate cost records are kept throughout each year.

**PROBLEMS****P1. [LO 3]**

- a. Satterfield's Custom Glass  
Schedule of Cost of Goods Manufactured  
For the Year Ended December 31, 2017

Beginning balance in work in process inventory		\$ 210,000
Add current manufacturing costs:		
Direct material	\$2,500,000	
Direct labor	3,000,000	
Manufacturing overhead	<u>1,700,000</u>	<u>7,200,000</u>
Total		7,410,000
Less ending balance in work in process inventory		<u>300,000</u>
Cost of goods manufactured		<u><u>\$7,110,000</u></u>

- b. Satterfield's Custom Glass  
Income Statement  
For the Year Ended December 31, 2017

Sales		\$8,500,000
Less cost of goods sold:		
Beginning finished goods inventory	\$ 500,000	
Add cost of goods manufactured	<u>7,110,000</u>	
Cost of goods available for sale	7,610,000	
Less ending finished goods inventory	<u>400,000</u>	<u>7,210,000</u>
Gross profit		1,290,000
Less nonmanufacturing expenses:		
Selling & admin. expenses		<u>1,350,000</u>
Net income (loss)		<u><u>(\$ 60,000)</u></u>

P2. [LO 3]

a. Terra Cotta Designs  
Schedule of Cost of Goods Manufactured  
For the Year Ended December 31, 2017

Beginning balance in work in process inventory		\$ 650,000
Add current manufacturing costs:		
Direct material:		
Beginning balance	\$ 450,000	
Purchases	1,500,000	
Ending balance	<u>(200,000)</u>	\$1,750,000
Direct labor	2,500,000	
Manufacturing Overhead	<u>650,000</u>	4,900,000
Total		5,550,000
Less ending balance in work in process inventory		<u>350,000</u>
Cost of goods manufactured		<u>\$5,200,000</u>

b. Terra Cotta Designs  
Income Statement  
For the Year Ended December 31, 2017

Sales		\$7,000,000
Less cost of goods sold:		
Beginning finished goods inventory	\$ 750,000	
Add cost of goods manufactured	<u>5,200,000</u>	
Cost of goods available for sale	5,950,000	
Less ending finished goods inventory	<u>350,000</u>	5,600,000
Gross profit		1,400,000
Less nonmanufacturing expenses:		
Selling expenses	500,000	
General & admin. expenses	<u>850,000</u>	1,350,000
Net income		<u>\$ 50,000</u>



**P4. [LO 2, 3, 4]**

a.

The beginning balance in Work in Process is \$14,500:

Job 258	\$5,000
Job 259	6,000
Job 260	<u>3,500</u>
Total	<u>\$14,500</u>

The ending balance in Work in Process Inventory is \$8,400:

Job 345	\$2,500
Job 346	<u>5,900</u>
Total	<u>\$8,400</u>

b.

The beginning balance in Finished Goods Inventory is \$9,000:

Job 257	\$9,000
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The ending balance in Finished Goods Inventory is \$11,700:

Job 341	\$ 1,500
Job 342	3,300
Job 343	2,400
Job 344	<u>4,500</u>
Total	<u>\$11,700</u>

c.

Cost of goods sold is determined as follows:

Beginning balance in work in process inventory		\$ 14,500
Add current manufacturing costs:		
Direct material	\$ 750,000	
Direct labor	1,650,000	
Manufacturing overhead	<u>2,150,000</u>	<u>4,550,000</u>
Total		4,564,500
Less ending balance in work in process inventory		<u>8,400</u>
Cost of goods manufactured		<u>\$4,556,100</u>
Beginning finished goods inventory		\$ 9,000
Add cost of goods manufactured		<u>4,556,100</u>
Cost of goods available for sale		4,565,100
Less ending finished goods inventory		<u>11,700</u>
Cost of goods sold		<u>\$4,553,400</u>

Job 257 through Job 340 likely relate to the balance of Cost of Goods Sold.

**P5. [LO 4, 5]**

- a. Predetermined overhead rate based on labor hours:

$$\$12,000,000 \div 300,000 \text{ hours} = \$40 \text{ per labor hour}$$

Overhead assigned to the model K25 shoe based on labor hours:

$$\$40 \times 11,000 \text{ hours} = \$440,000$$

Predetermined overhead rate based on labor cost:

$$\$12,000,000 \div \$4,800,000 = \$2.50 \text{ per labor dollar}$$

Overhead assigned to the model K25 shoe based on labor cost:

$$\$2.50 \times \$165,000 = \$412,500$$

- b. Direct labor cost is the preferred allocation base because workers paid a higher rate work on more complex jobs, and more complex jobs lead to more overhead cost.

**P6. [LO 4, 5]**

- a. Predetermined overhead rate based on direct labor cost:

$$\$200,000 \div \$300,000 \text{ labor cost} = \$0.67 \text{ per labor dollar}$$

Predetermined overhead rate based on direct labor hours:

$$\$200,000 \div 25,000 \text{ hours} = \$8.00 \text{ per labor hour}$$

Predetermined overhead rate based on machine hours:

$$\$200,000 \div 8,000 \text{ machine hours} = \$25 \text{ per machine hour}$$

- b.

**Overhead based on labor cost**

	<u>Job 9823</u>	<u>Job 9824</u>
Direct material	\$ 1,000	\$2,000
Direct labor	1,400	1,400
Mfg. overhead	<u>938</u>	<u>938</u>
Total	<u>\$3,338</u>	<u>\$4,338</u>

**Overhead based on labor hours**

	<u>Job 9823</u>	<u>Job 9824</u>
Material	\$ 1,000	\$ 2,000
Labor	1,400	1,400
Overhead*	<u>1,200</u>	<u>1,040</u>
Total	<u>\$ 3,600</u>	<u>\$ 4,440</u>

\*Actual direct labor hours x \$8

**Overhead based on machine hours**

	<u>Job 9823</u>	<u>Job 9824</u>
Material	\$1,000	\$ 2,000
Labor	1,400	1,400
Overhead*	<u>3,250</u>	<u>6,750</u>
Total	<u>\$5,650</u>	<u>\$10,150</u>

\*Actual machine hours x \$25

- c. Given that depreciation on equipment accounts for 75 percent of applied overhead costs, an allocation based on machine hours seems reasonable. However, users of the job cost information should keep in mind that the applied overhead portion of job cost is not an incremental cost.

**P7. [LO 5]**

- a. Net Income, if over-applied overhead is immaterial and assigned to Cost of Goods Sold.

OH applied = .75 x \$700,000 =	\$525,000
Actual OH =	<u>450,000</u>
	<u>\$ 75,000</u>

Therefore, overhead was over-applied by \$75,000

Sales	\$2,500,000
CGS (\$1,000,000 - \$75,000)	<u>925,000</u>
Gross Profit	1,575,000
Selling & Admin. Expenses	<u>1,000,000</u>
Net Income	<u>\$ 575,000</u>

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- b. Net Income, if over applied overhead is material and prorated among appropriate accounts.

	Balance	Proportion	Adjustment	Adjusted Balance
WIP Inventory	\$ 80,000	0.071	\$ 5,325	\$ 74,675
FG Inventory	48,000	0.043	3,225	44,775
COGS	<u>1,000,000</u>	<u>0.886*</u>	<u>66,450</u>	<u>933,550</u>
Total	<u>\$1,128,000</u>	<u>1.000</u>	<u>\$75,000</u>	<u>\$1,053,000</u>

\*Rounded so total equals 1.000

Sales	\$2,500,000
CGS	<u>933,550</u>
Gross Profit	1,566,450
Selling Expenses	400,000
Admin Expenses	<u>600,000</u>
Net Income	<u>\$ 566,450</u>

- c. Charging the entire amount of overapplied overhead to Cost of Goods Sold results in higher net income than prorating overapplied overhead among Work in Process, Finished Goods, and Cost of Goods Sold.

**P8. [LO 5]**

- a. If overapplied overhead is assigned to Cost of Goods Sold, the adjusted balance will be:

$$\$440,000 - \$50,000 = \$390,000.$$

- b. If overapplied overhead is assigned to Work in Process Inventory, Finished Goods Inventory, and Cost of Goods Sold, the adjusted balances will be:

	Balance	Proportion	Adjustment	Adjusted Balance
WIP Inv.	\$ 66,000	0.12	\$ 6,000	\$ 60,000
FG Inv.	44,000	0.08	4,000	40,000
COGS	<u>440,000</u>	<u>0.80</u>	<u>40,000</u>	<u>400,000</u>
Total	<u>\$550,000</u>	<u>1.00</u>	<u>\$50,000</u>	<u>\$500,000</u>

**P9. [LO 4, 5, 6]**

- a. Indirect cost per hour of service is \$65:

$$50 \text{ professionals} \times 1,600 \text{ hours} = 80,000 \text{ hours per year.}$$

$$\$5,200,000 \text{ indirect cost} \div 80,000 \text{ hours} = \$65 \text{ per hour.}$$



- b. Estimated cost of services for a potential client:

Average salary per billable hour = \$120,000 per year ÷ 1,600 hours = \$75 per hour.

Professional service (100 hours × \$75 per hour)	\$ 7,500
Indirect costs (100 hours × \$65 per hour)	<u>6,500</u>
Total	<u>\$14,000</u>

**P10. [LO 2, 4]**

- a.  $\$30,000 + \$40,000 - \$15,000 = \$55,000$
- b.  $\$80,000 + \$55,000 + \$45,000 + \$63,000 - \$82,000 = \$161,000$
- c.  $\$95,000 + \$161,000 - \$110,000 = \$146,000$
- d.  $\$70,000 - \$60,000 = \$10,000$

**P11. [LO 4, 5]**

- a. The predetermined overhead rate is \$2.57 per direct labor dollar  
( $\$9,000,000 \div 3,500,000 = \$2.57$ ).
- b. Work in Process Inventory 5,750,000  
Raw Materials Inventory 5,750,000
- c. Work in Process Inventory 4,000,000  
Wages payable 4,000,000
- d. Work in Process Inventory 10,280,000  
Manufacturing Overhead 10,280,000  
( $\$4,000,000 \times \$2.57 = \$10,280,000$ )
- e. Cost of Goods Sold 720,000  
Manufacturing overhead 720,000  
( $\$11,000,000 - \$10,280,000 = \$720,000$ )

**P12. [LO 4, 5]**

a.	Job 201	$\$17,000 \times \$3.25 =$	\$ 55,250
	Job 202	$\$20,500 \times \$3.25 =$	66,625
	Job 203	$\$9,000 \times \$3.25 =$	<u>29,250</u>
			<u>\$ 151,125</u>

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b.	Job 201	$\$9,500 \times \$3.33 =$	\$ 31,635
		$\$3,000 \times \$4.76 =$	14,280
		$\$4,500 \times \$2.40 =$	<u>10,800</u>
			<u>56,715</u>
	Job 202	$\$5,000 \times \$3.33 =$	16,650
		$\$6,500 \times \$4.76 =$	30,940
		$\$9,000 \times \$2.40 =$	<u>21,600</u>
			<u>69,190</u>
	Job 203	$\$2,000 \times \$3.33 =$	6,660
		$\$5,000 \times \$4.76 =$	23,800
		$\$2,000 \times \$2.40 =$	<u>4,800</u>
			<u>35,260</u>
	Total		<u>\$161,165</u>

- c. It appears that the relation between overhead and labor cost is different in the three production departments. Thus, it is preferable to use separate overhead rates for each.

### P13. [LO 2, 4, 5]

a.	Confectioners' sugar (2,100 lbs. $\times$ \$0.80)	\$1,680
	Granulated sugar (2,300 lbs. $\times$ \$0.90)	2,070
	Chocolate (900 lbs. $\times$ \$4.00)	3,600
	Caramel (300 lbs. $\times$ \$1.50)	450
	Eggs (60 doz. $\times$ \$0.85)	51
	Paraffin (90 lbs. $\times$ \$0.50)	<u>45</u>
		<u>\$7,896</u>

Raw Materials Inventory	7,896	
Accounts payable (various)		7,800
Cash		96
(To record purchase of sugar, chocolate, caramel, eggs, & paraffin)		
Work in Process Inventory	5,400	
Wages Payable		5,400
(To record direct labor cost)		
Manufacturing Overhead	2,500	
Wages Payable		2,500
(To record indirect labor cost)		
Manufacturing Overhead	6,150	
Utilities Payable		400
Rent Payable		750
Accounts Payable		5,000
(To record overhead costs incurred)		
Work in Process Inventory	6,896	
Raw Materials Inventory		6,896
(To record raw materials used: $\$2,500 + 7,896 - \$3,500 = \$6,896$ )		
Work in Process Inventory	7,650	
Manufacturing Overhead		7,650
(To record overhead cost applied to jobs = $\$17 \times 450$ hours)		
Finished Goods Inventory	21,446	
Work in Process Inventory		21,446
(To record production of finished goods: $\$6,500 + \$5,400 + \$6,896 + \$7,650 - \$5,000 = \$21,446$ )		
Accounts Receivable	35,000	
Sales Revenue		35,000
(To record sales)		
Selling & Admin. Expenses	9,000	
Accounts Payable		9,000
(To record nonmanufacturing expenses incurred)		

2-20 **Jiambalvo** Managerial Accounting

Cost of Goods Sold	24,446	
Finished Goods Inventory		24,446
(To record cost of sales: \$9,000 + \$21,446 - \$6,000)		

Cost of Goods Sold	1,000	
Manufacturing Overhead		1,000
(To record allocation of underapplied overhead to CGS) (6,150 + 2,500 - 7,650 = 1,000)		

Lane Confectioners

b. Income Statement for the Month of March

Revenue	\$35,000	
Cost of goods sold	<u>25,446</u>	(\$24,446 + \$1,000)
Gross margin	9,554	
Selling & Admin. Exp.	<u>9,000</u>	
Net income (loss)	<u>\$ 554</u>	

**P14. [LO 4, 5]** Approximately 66 percent of overhead costs (\$160,000 + \$135,000) ÷ \$450,000 are related to machinery. Without additional information, it appears that machine hours would be an appropriate overhead allocation base.

The predetermined overhead allocation rate = \$450,000 ÷ 15,000 machine hours = \$30 per machine hour.

**P15. [LO 5, 6]**

Overhead is overapplied

Applied overhead (\$6 x 35,000)	\$210,000
Actual overhead	<u>200,000</u>
Overapplied overhead	<u>\$ 10,000</u>

**P16. [LO 5, 6]**

a. The predetermined overhead rate is \$17 per repair technician hour (\$170,000 ÷ 10,000 = \$17).

b. Overhead applied = \$17 × 7,000 = \$119,000

Overhead applied is \$119,000 while actual overhead is \$140,000. Thus, overhead is underapplied by \$21,000 (\$119,000 – \$140,000 = \$21,000)

c. The journal entry to close the account to Cost of Goods Sold is:

Cost of Goods Sold	21,000	
Manufacturing Overhead		21,000

**P17. [LO 4, 5, 6]**

a. The predetermined overhead rate is \$2,750 per hour of operating room use.

(\$5,500,000 ÷ 2,000 hours = \$2,750). The total overhead charge to Candice for 3 hours of operating room usage is \$8,250 (\$2,750 x 3 hours).

b. The total cost of the knee surgery is \$24,250:

Pharmacy	\$ 450
Sterile supply	1,500
Supplies other	4,500
OR services	4,500
Anesthesia	1,500
Anesthesiologist	3,500
OR overhead charges	<u>8,250</u>
	<u>\$24,200</u>

**Case 2-1. [LO General chapter concepts and ethics]**

**BRIXTON SURGICAL DEVICES**

**Summary**

The COO and CFO of a public company are coming up with “schemes” to manage earnings up in an effort to beat an aggressive earnings target which determines their bonus compensation.

- Indicates how profit can be “boosted” by overproduction.
- Indicates how channel stuffing can boost profit.
- Raises the interesting question “Does compliance with GAAP equate to ethical behavior?”

**Questions to ask students**

1. What’s the situation at Brixton Surgical Devices?
2. How do Ed and Robin plan to increase profit?
3. Are their planned methods ethical and how will they affect shareholder value?

**Discussion**

Ed (the COO) and Robin (the CFO) realize that their company is not likely to meet their earnings target and, in consequence, they won’t receive bonuses. To increase profit, they plan to offer discounts to customers for orders in October and November that can be shipped in December. This strategy is sometimes referred to as “channel stuffing” since the sales channel is being “stuffed” with merchandise. In reality, the company is simply moving sales that would have taken place next year into the current year. Arguably, this does not violate GAAP, since the company has actual orders that are shipped before year-end. However, this would require complete footnote disclosure in the annual report or shareholders might be misled and think there is a permanent increase in revenue. And, they may react quite negatively when profit is down in the first quarter of the next year.

The second strategy, increasing production to lower unit costs and bury fixed production costs in inventory, also, most likely, does not violate GAAP. But it certainly hurts shareholder value. The company is using shareholders’ money to make an investment in inventory that is not really needed.

Are these two strategies ethical? The answer to this question is, of course, subjective. Based on the ethical framework presented in chapter 1, I believe the strategies are not ethical. Consider questions 3 and 5 from the 7 question framework:

3. Will an individual or an organization be harmed by any of the alternatives?

5. Would someone I respect find any of the alternatives objectionable?

Shareholders are harmed by the buildup in inventory and they will be misled by channel stuffing unless there is full disclosure (which would not suit the aims of the COO and CFO). Also, it seems quite likely that someone the COO and CFO respect will find the strategies objectionable.

**Case 2-2. [LO 4, 5, 6]**

**YSL MARKETING RESEARCH**

**Summary**

Marketing research firm is bidding on a job and is considering various costs.

- Requires calculation of full cost and consideration of incremental costs including opportunity costs.
- Brings up the importance of factors that are difficult to quantify.

**Questions to ask students**

1. Summarize the situation facing YSL Marketing Research.
2. What is the expected full cost of the Surenex engagement?
3. What is the lowest amount that Connie Bachmann, a partner at YSL, can bill without hurting company profit?
4. What should Connie consider in addition to the amount just calculated?

**Discussion**

Begin the discussion by asking a student to summarize the situation facing YSL Marketing Research. The company has been asked to conduct a survey for Surenex—a firm that has the potential to be a valued long-run client. However, Surenex is not currently willing to pay YSL’s normal billing rates, due to its current cash-flow challenges.

- a. A student is then asked to calculate the full cost of the project.

**Full Cost**

Partner salary (40 hours × \$120)	\$4,800
Staff salary (100 hours × \$40)	4,000
Direct charges	3,000
Overhead (.31 × \$8,800)	<u>2,728</u>
Total	<u>\$14,528</u>

**Overhead calculation**

Estimated overhead	\$ 496,000
÷ Estimated professional compensation	<u>1,600,000</u>
Overhead rate	<u>\$ 0.31</u>

- b. What is the lowest amount that Connie can bill on this engagement without hurting company profit? The point of this question is to show that the answer is neither the full cost (\$14,528) nor the variable cost of the job (assuming the



variable costs are salaries and direct charges). To answer the question, students must consider the fact that if the Surenex job is undertaken, YSL will need to turn down business for which it can bid 1.5 times compensation plus out-of-pocket costs. That is, students must consider opportunity cost. If the company takes on the Surenex job, it will miss out on billing \$13,200 (1.5 x \$8,800) of professional compensation on some other job. In addition, to avoid hurting profit, the company must cover out-of-pocket costs. Thus, the lowest amount that Connie can bill is \$16,200.

Professional compensation	\$4,800
	<u>4,000</u>
	<u>\$8,800</u>
Salaries (\$8,800 × billing at 1.5 times)	\$13,200
Plus: Direct out-of-pocket costs	<u>3,000</u>
Total	<u>\$16,200</u>

- c. The discussion concludes with the question, “What should Connie consider in addition to the amount just calculated?” Hopefully, a student will recognize that our previous analysis was short sighted in that we did not consider the fact that Surenex may end up being a hot company with “premium billing opportunities.” Therefore, YSL may be better off in the long-run by setting a relatively low price on the current job. Even a price that does not cover salaries and direct charges could be warranted if the prospect for future profit, from working for Surenex, is very high.

**Case 2-3. [LO 4, 5]**

**DUPAGE POWDER COATING**

**Summary**

A company has bought a computer-controlled, electrostatic powder coating system. The result is overhead has increased (due to depreciation of the system) and labor hours have decreased. Since labor hours is the overhead allocation base, the overhead rate has increased. It now appears that small jobs, which still use the old manual system, are more costly than they were in the prior year—even though they are processed using the same equipment and labor as in the prior year.

- Indicates how costs can be distorted by overhead allocation.

**Questions to ask students**

1. What's the situation at DuPage Powder Coating?
2. What would the job have cost in the prior year and what did it cost this year?
3. Why have the cost of small jobs increased?
4. Should the company increase the prices of small jobs since costs have increased?

**Discussion**

- a. The cost of the job in the current year is:

Direct material	\$500
Direct labor (7 hours x \$20)	140
Manufacturing overhead (7 labor hours x \$22.15)	<u>155</u>
Total cost	<u>\$795</u>

- b. The cost of the job in the prior year was:

Direct material	\$500
Direct labor (7 hours x \$20)	140
Manufacturing overhead (7 labor hours x \$12)	<u>84</u>
Total cost	<u>\$724</u>

The new overhead rate is determined as follows:

Expected total overhead	\$1,440,000
÷ Expected labor hours	<u>65,000</u>
Overhead rate	<u>\$22.15</u>

c. The fact that the cost of this job has increased from \$724 to \$795 does not indicate that the company is less efficient at handling small jobs in the current year. The increase is due to the purchase of the new equipment (which this job does not even use), which increased overhead and reduced labor, resulting in a large increase in the overhead rate.

d. The decision to raise the price of small jobs should not be affected by the apparent increase in the cost of small jobs—that increase is artificial in that small jobs don't even use the equipment that led to the higher overhead rate. A price increase should be determined based on an analysis of capacity and opportunity costs.

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