**Project Scheduling**

**eWorkbook Worksheets**

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**

**2nd Edition**

***Project Scheduling eWorkbook Worksheets* 2nd Edition**

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**(Worksheets are in Word format)**

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**Worksheet Access and Use**

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For quick access, the table of contents provides bookmarks to the individual worksheets. Place mouse on desired worksheet and hold the control button while left clicking to go to the selected worksheet.

**Word Worksheet:** The *Project Scheduling eWorkbook Worksheets* in a word file without watermarks allows students to fully edit rather than just annotate the worksheet using word for which they are more familiar. The student or instructor uses “Share Screen” to edit the document while collaborating with a team or the whole class.

**Google Doc Worksheet**: Most worksheets can be edited simultaneously by the entire team, when converted from Word to Google Docs for a more collaborative experience. To do this extract all the worksheets for a specific class session from the *Project Scheduling eWorkbook Worksheets* and place in a word file with a unique name. If a worksheet is unique to each team, it will be necessary to create multiple copies to provide a worksheet for each team.Then upload, open, and save to Google docs. Ensure the file translated properly or make required corrections. Set up Edit privileges and Share the file with the class.



**1.1 Project Life Cycle**

**PM Course Project Life Cycle Phases**

Phases:

Bar Graph of Project Phases





**1.2 Starting MS Project**

**MS Project Ribbons Solution**



**MS Project Functions**





**2.1 Work Breakdown Structures**

**Commercial Construction Template WBS Info**

****

Commercial Construction Template Items: \_\_\_\_\_\_

Commercial Construction Template Tasks: \_\_\_\_\_\_

Commercial Construction Template Summary Tasks: \_\_\_\_

Commercial Construction Template Levels: \_\_



**2.2 Kitchen Replacement WBS**

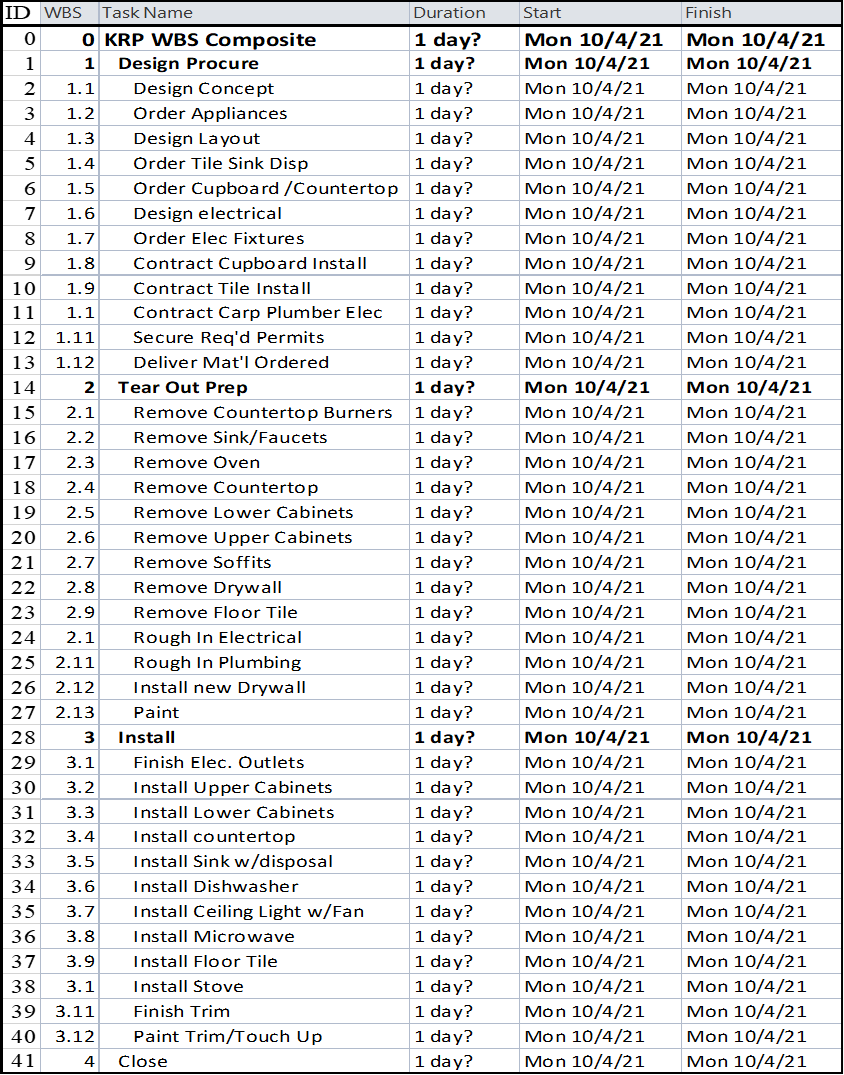
**Kitchen Replacement WBS Worksheet**

* **Team 1 - Project Phase:**
* **Team 2 - Project Phase:**
* **Team 3 - Project Phase:**



**2.3 MS Project KRP Work Breakdown**

**KRP WBS Composite Spreadsheet**



**KRP Items:** \_\_ **KRP Levels:** \_\_ **KRP Elements in Level One**: \_\_

**Tasks by Phase:** Design/Procure \_\_, Tear Out/Prep \_\_, Install \_\_, Close \_\_, **Total \_\_**



**3.1 Network Diagram**

**A**

**B**

**C**

**D**

**E**

**F**

**G**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Task ID** | **A** | **B** | **C** | **D** | **E** | **F** | **G** |
| **Pred. ID** |  |  | **A, B** | **B** | **A** | **C, D** | **E, F** |



**3.2 PDM Networks Team 1**

**A**

**B**

**C**

**D**

**E**

**F**

**G**

**H**

**I**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task ID** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** |
| **Pred. ID** |  |  | **A** | **A** | **B** | **B** | **D, E** | **C** | **F, G, H** |



**3.2 PDM Networks Team 2**

**A**

**B**

**C**

**D**

**E**

**F**

**G**

**H**

**I**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task ID** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** |
| **Pred. ID** |  | **A** | **A** | **A** | **B** | **B** | **B** | **C, D** | **E, F, G, H** |



**3.2 PDM Networks Team 3**

**A**

**B**

**C**

**D**

**E**

**F**

**G**

**H**

**I**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task ID** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** |
| **Pred. ID** |  |  |  | **A, B** | **B, C** | **D, E** | **E** | **A** | **H** |



**3.3 Kitchen Replacement Network**

****

****

****



**4.1 Estimating Techniques**

**4.1 Team 1 –**List assumptions, show all calculations, and round any fractions up to next whole number

You are estimating the time to paint the interior rooms of your company’s High Point Hotel Complex which contains 100 units. You have four hours to complete the estimate next year’s annual plan of unit availability. Two years ago, a similar project to paint the interior of the Central Arms Hotel that included 80 units took eight weeks. What time would you estimate?

**4.1 Team 2 –** List assumptions, show all calculations, and round any fractions up to next whole number

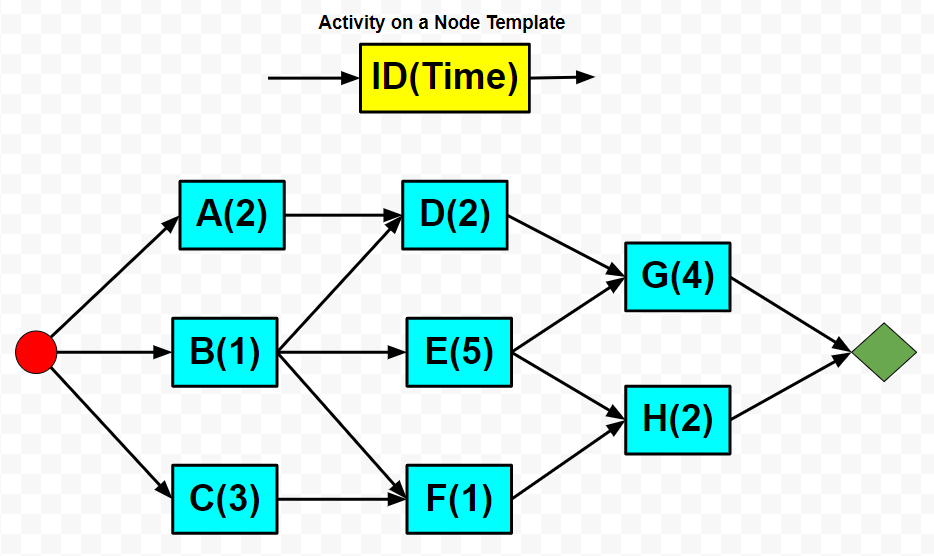
You are estimating a project to paint the interior rooms of the 100-unit High Point Hotel Complex. You need to define the overall duration of the project and the maximum number of units out of service. Based on your experience, a two-man crew can complete three typical hotel rooms in 3 days. Using a four-man crew, six days a week, determine workdays and maximum number of units out of service? Round partial days to the next full day.

**4.1 Team 3 –** List assumptions, show all calculations, and round any fractions up to next whole number

You are estimating painting the interior rooms of the 100-unit Hotel Complex. A maximum of six rooms can be out of service at any time. You plan to use a four-man crew working six days a week with the following performance on similar projects: Averaged 12 rooms/week, Best being 15 rooms/week, Worst being six rooms/week. What is your best estimate on project duration?



**4.2 Identifying Network Paths**

****



**4.3 Durations**



****



**5.1 Resources**

**Over-allocated Tasks and Resources**



**Resource Over-allocation Dates**



**Original Plan**

**Tear Out**

**& Prep**

**Design**

**Procure**

**Close**

**Install**



**5.2 Resource Overallocation Resolution Ideas**

**Design/Procure**

**Tear Out/Prep**

**Install**



**6.1 Resource Smoothing Part A**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Resource Smoothing Solution** | | | | | | | | | |
| **Task** | **Wk 1** | **Wk 2** | **Wk 3** | **Wk 4** | **Wk 5** | **Wk 6** | **Wk 7** | **Wk 8** | **Wk 9** |
| **A** |  |  |  |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |  |  |  |
| **C** |  |  |  |  |  |  |  |  |  |
| **D** |  |  |  |  |  |  |  |  |  |
| **E** |  |  |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |  |  |

**6.1 Resource Leveling Part B**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Resource Leveling @ 4 Workers Solution** | | | | | | | | | |
| **Task** | **Wk 1** | **Wk 2** | **Wk 3** | **Wk 4** | **Wk 5** | **Wk 6** | **Wk 7** | **Wk 8** | **Wk 9** |
| **A** |  |  |  |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |  |  |  |
| **C** |  |  |  |  |  |  |  |  |  |
| **D** |  |  |  |  |  |  |  |  |  |
| **E** |  |  |  |  |  |  |  |  |  |
| **Total** |  |  |  |  |  |  |  |  |  |



**6.2 Smoothing in MS Project**



**Smoothing Plan**

**Tear Out**

**& Prep**

**Design**

**Procure**

**Close**

**Install**



**6.3 Leveling in MS Project**



**Leveling Plan**

**Tear Out**

**& Prep**

**Design**

**Procure**

**39**

**Close**

**Install**



**6.4 Fix Resources Overallocations**

**Tear Out**

**& Prep**

**Design**

**Procure**

**Close**

**Install**

**Total Project \_\_\_ workdays**





**7.1 Forward and Reverse Pass**

Double click on an activity box to enter values in the excel table

**Early Start**

**Early Finish**

**Float**



**Activity**

**Late Finish**

**Late Start**

**Time**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Forward & Reverse Pass Table - Class Worksheet** | | | | | | | | |
| **Activity** | **Pred.** | **Time** | **Earliest** | | **Latest** | | **Float** | **Critical**  **Path** |
| **ES** | **EF** | **LS** | **LF** |
| **A** | **-** | **2** |  |  |  |  |  |  |
| **B** | **-** | **4** |  |  |  |  |  |  |
| **C** | **A, B** | **1** |  |  |  |  |  |  |
| **D** | **C** | **3** |  |  |  |  |  |  |
| **E** | **C** | **2** |  |  |  |  |  |  |



**7.2 Kitchen Replacement Critical Path**

**Team 1 - Design Procure Critical Path**

Double click on an activity box to enter ES, EF, LS, & LF values in the excel table

** **

**** ****

**** **** **** ****

**** **** ****

****

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Forward & Reverse Pass Table - Class Worksheet** | | | | | | | | |
| **ID** | **Activity** | **Pred.** | **Time** | **Earliest** | | **Latest** | | **Float** | **Critical**  **Path** |
| **ES** | **EF** | **LS** | **LF** |
| **2** | Concept Design | **-** | **5** |  |  |  |  |  |  |
| **3** | Order Appliances | **2** | **5** |  |  |  |  |  |  |
| **4** | Layout Design | **2** | **1** |  |  |  |  |  |  |
| **5** | Order Floor., Sink, Disposal | **4** | **2** |  |  |  |  |  |  |
| **6** | Order Cupboard/Top | **4** | **1** |  |  |  |  |  |  |
| **7** | Electrical Design | **4** | **2** |  |  |  |  |  |  |
| **8** | Order Elec. Fixtures | **7** | **2** |  |  |  |  |  |  |
| **9** | Contract Cupboard. Install | **6** | **3** |  |  |  |  |  |  |
| **10** | Contract Tile Install | **5** | **3** |  |  |  |  |  |  |
| **11** | Contr. Carp/Elec/Plum | **4,5,7** | **5** |  |  |  |  |  |  |
| **12** | Secure Permits | **9,10,11** | **8** |  |  |  |  |  |  |
| **13** | Delivery. Materials | **3,5,6,8** | **24** |  |  |  |  |  |  |

**7.2 Team 2 - Tear Out Prep Critical Path**

Double click on an activity box to enter values in the excel table

**** **** ****

**** **** **** ****

**** ****

**** **** ****

****

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Forward & Reverse Pass Table - Class Worksheet** | | | | | | | | |
| **ID** | **Activity** | **Pred.** | **Time** | **Earliest** | | **Latest** | | **Float** | **Critical**  **Path** |
| **ES** | **EF** | **LS** | **LF** |
| **2** | Remove Burners | **-** | **2** |  |  |  |  |  |  |
| **3** | Remove Sink/Faucet | **-** | **1** |  |  |  |  |  |  |
| **4** | Disc & Remove oven | **-** | **1** |  |  |  |  |  |  |
| **5** | Remove Countertop | **2,3** | **1** |  |  |  |  |  |  |
| **6** | Remove Lower Cab. | **5** | **2** |  |  |  |  |  |  |
| **7** | Remove Upper Cab. | **4** | **1** |  |  |  |  |  |  |
| **8** | Remove Soffett | **7** | **1** |  |  |  |  |  |  |
| **9** | Remove Drywall | **6,8** | **1** |  |  |  |  |  |  |
| **10** | Remove Floor Tile | **6,8** | **1** |  |  |  |  |  |  |
| **11** | Rough in Electrical | **9** | **2** |  |  |  |  |  |  |
| **12** | Rough in Plumbing | **9** | **1** |  |  |  |  |  |  |
| **13** | Install new Drywall | **10,11,12** | **1** |  |  |  |  |  |  |
| **14** | Paint | **13** | **1** |  |  |  |  |  |  |

**7.2 Team 3 - Install Critical Path**

Double click on an activity box to enter values in the excel table

**** **** ****

**** **** ****

**** **** ****

**** **** ****

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Forward & Reverse Pass Table – Team 3 Worksheet** | | | | | | | | |
| **ID** | **Activity** | **Pred.** | **Time** | **Earliest** | | **Latest** | | **Float** | **Critical**  **Path** |
| **ES** | **EF** | **LS** | **LF** |
| **2** | Finish Electrical Outlets | **-** | **1** |  |  |  |  |  |  |
| **3** | Install Upper Cabinets | **2** | **2** |  |  |  |  |  |  |
| **4** | Install Lower Cabinets | **2** | **1** |  |  |  |  |  |  |
| **5** | Install Countertop | **4** | **1** |  |  |  |  |  |  |
| **6** | Install Sink w/disposal | **5** | **1** |  |  |  |  |  |  |
| **7** | Install Dishwasher | **5** | **2** |  |  |  |  |  |  |
| **8** | Install Light w/fan | **3** | **1** |  |  |  |  |  |  |
| **9** | Install Microwave | **3** | **2** |  |  |  |  |  |  |
| **10** | Install new Floor Tile | **6,7** | **1** |  |  |  |  |  |  |
| **11** | Install Stove | **10** | **1** |  |  |  |  |  |  |
| **12** | Finish Trim | **10** | **2** |  |  |  |  |  |  |
| **13** | Paint Trim & Touch Up | **8,9,11,12** | **1** |  |  |  |  |  |  |



**7.3 Critical Path in MS Project**

****

****

****



**8.1 Estimating Accuracy Sample Response**

****



**8.2 KRP Cost in MS Project Solution Part A**









**8.2 KRP Cost Reduction Ideas Sample Response Part B**

****

****

****



**8.3 KRP Budget Resolution Solution**

****



**9.1 Baseline in MS Project Solution**

**1.) Permits Complete**

**1b.) Construction Lag to 1/24/22**

**2.) Material Delivery Complete**

**3.) Tear Out Prep Complete**

**4.) Install Complete**

**Tear Out**

**& Prep**

**Baseline Plan**

**Design**

**Procure**

**Install**

**Close**





**9.2 Status in MS Project**



**9.2 Status in MS Project Statistics After Corrections**

**Design Procure Statistics** - No corrections required due to delay introduced for construction.



**Tear Out Prep Statistics –** PM and Spouse work Saturday to finish removing soffitt to recover day lost and get back on schedule.



**Install Statistics –** Added second carpenter to finish trim task recover 1 day. Added Spouse to help PM perform paint trim/touch up and close tasks to recover half a day on each task.



**Milestones**

**Permits Complete: \_\_\_\_\_\_\_\_**

**Material Delivery Complete: \_\_\_\_\_\_\_\_\_**

**Tear Out Prep Complete: \_\_\_\_\_\_\_\_\_\_\_**



**10.1 Earned Value Example Solution**

**1.) Performance**

**SV = EV – PV =**

**SPI = EV/PV =**

**Schedule Status: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CV = EV/AC =**

**CPI = EV/AC =**

**Budget Status: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**2.) Cause: Conditions contributing to this performance**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**3.) Forecast at 100% efficiency for balance of the Project**

**ETC = (BAC-EV)/1.00 =**

**EAC = ETC + AC =**

**4.) TCPI Needed to meet the Budget Goal**

**TCPI = (BAC-EV)/(BAC-AC) =**

**5.) Probability: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**



**10.2 Earned Value Team #\_\_\_**

**1.) Performance**

**SV = EV – PV =**

**SPI = EV/PV =**

**Schedule Status: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CV = EV/AC =**

**CPI = EV/AC =**

**Budget Status: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**2.) Cause: Conditions contributing to this performance**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**3.) Forecast at 100% efficiency for balance of the Project**

**ETC = (BAC-EV)/1.00 =**

**EAC = ETC + AC =**

**4.) TCPI Needed to meet the Budget Goal**

**TCPI = (BAC-EV)/(BAC-AC) =**

**5.) Probability: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**



**10.3 Earned Value in MS Project Solution**

****

Durations % Complete =

Actual Duration =

Work % Work Complete =

Cost % Budget Spent =