

Aggregate Production Planning Strategies (Dr. Simons)

| Strategy | Variables | Rows needed | | Calculations |
|---|---|---|--|---|
| <p align="center"><u>Chase</u> (Produce exactly what's needed in each time period.)</p> | <ul style="list-style-type: none"> • Vary work force size (hire & lay off) • No inventory holding or shortage • Constant production rate | Plan | Production requirement | (# units demanded + safety stock) – beginning inventory |
| | | | Hours required | Production requirement * # hours needed to produce one unit |
| | | | # days in period | (given) |
| | | | Hours per worker | # hours per day * # days in the period |
| | | | # workers needed | Hours required / hours per worker per period |
| | | | # hired | Max {workers needed – previous period workforce, 0} |
| | | | # laid off | Max {previous period workforce - workers needed, 0} |
| | | Costs | <i>Regular time cost</i> | <i>Hours required * regular time labor rate</i> |
| | | | <i>Hiring cost</i> | <i># hired * hiring cost</i> |
| | | | <i>Layoff cost</i> | <i># laid off * layoff cost</i> |
| <i>Total cost</i> | <i>Regular time + hiring + layoff costs</i> | | | |
| <p align="center"><u>Level</u> (Produce at a constant rate)</p> | <ul style="list-style-type: none"> • Constant work force size • Constant production rate • Inventory will vary (excesses & shortage) | Plan | Production requirement | (# units demanded + safety stock) – beginning inventory |
| | | | # days in period | (given) |
| | | | Hours per worker | # hours per day * # days in the period |
| | | | # workers used | Given or calculated as # workers needed to produce average requirement |
| | | | # units produced | (Hours per worker * # workers used) / # hours needed to produce one unit |
| | | | Beginning inventory | (given) |
| | | | Ending inventory | Beginning inventory + # units produced - production requirement |
| | | Costs | <i>Initial w/f adjustment</i> | <i>Hiring or layoff cost, if needed to get # workers used</i> |
| | | | <i>Regular time labor cost</i> | <i># workers used * hours per worker * regular time labor rate</i> |
| | | | <i>Inventory carrying cost</i> | <i>Max {ending inventory, 0} * carrying cost per unit per period</i> |
| | | | <i>Backorder cost</i> | <i>Min {ending inventory, 0} * backorder cost per unit per period</i> |
| | | | <i>Total cost</i> | <i>Initial hiring/layoff + regular time + inventory carrying + backorder costs</i> |
| | | | <p align="center"><u>Stable work force – vary production rate</u> (Produce at a constant rate, using overtime as needed)</p> | <ul style="list-style-type: none"> • Constant work force size (lower than level strategy) • Work overtime when needed • No inventory holding or shortage |
| Hours required | Production requirement * # hours needed to produce one unit | | | |
| # days in period | (given) | | | |
| Hours per worker | # hours per day * # days in the period | | | |
| # workers used | Given or calculated as # workers needed to produce lowest requirement | | | |
| Regular time hours used | Hours per worker * # workers used | | | |
| Overtime hours used | Max {hours required – regular time hours used, 0} | | | |
| Costs | <i>Regular time cost</i> | <i>Regular time hours used * regular time labor rate</i> | | |
| | <i>Overtime cost</i> | <i>Overtime hours used * overtime labor rate</i> | | |
| | <i>Initial w/f adjustment</i> | <i>Hiring or layoff cost, if needed to get # workers used</i> | | |
| | <i>Total cost</i> | <i>Initial hiring/layoff + regular time + overtime costs</i> | | |
| Mixed or hybrid | More than one variable used | Combine rows from other strategies, as needed | (Although the rows needed will depend on the strategy, each needed row will be computed as described in other strategies) | |