**Critical Path Calculations Cheat Sheet**

KEY TERMS

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| CRITICAL PATH | The sequence of project activities that add up to the longest overall duration is the **critical path**. This determines the shortest time possible to complete the project. |
| TASK | An activity performed during the course of a project is a **task**. |
| DURATION (D) | The total time required to complete an activity is the **duration**. |
| EARLY START (ES) | The earliest time an activity can start once the previous dependent activities are completed is the **early start**. |
| LATE START (LS) | The latest time an activity can start without delaying the project is the **late start**. |
| EARLY FINISH (EF) | The earliest time an activity can be completed is the **early finish**. |
| LATE FINISH (LF) | The latest time an activity can finish without delaying the project is the **late finish**. |
| FLOAT | The amount of time that an activity can be delayed without causing a delay to the overall project is **float** or **slack** time. |

FORMULAS

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| **FORWARD PASS (Calculate ES and EF)** |
| **ES of the first activity** | Usually set to zero. |
| **EF** | **EF = ES + Duration** |
| **For subsequent activities, ES is the maximum EF of all immediate predecessors.** |
| **BACKWARD PASS (Calculate LS and LF)** |
| **LF of the last activity** | Set this equal to EF (when project deadline is not an issue). |
| **LS** | **LS = FL - Duration** |
| **For preceding activities, LF is the minimum LS of all immediate successors.** |
| **Calculate Float** |
| **Total Float** | **Total Float = LF – EF (or LS – ES)** |
| **Activities with zero float lie on the critical path.** |

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| CRITICAL PATH IDENTIFICATION | * **Identify** all paths in the project network from start to finish.
* **Calculate** the duration of each path by summing up the durations of all activities in that path.
* **The longest path is the critical path**. Activities in this path have zero float.
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