

# Scheduling 2 Day Structure

## Day 1

### Session 1: Design and Structure your Schedule

1. Basic framework of a schedule
  - a. Purpose = communication not control
  - b. Understand audience
2. Activities & Milestones
  - a. Milestones
  - b. Attributes of an activity
  - c. Durations
3. Logic Links
  - a. Rules of logic
  - b. Link types
    - i. FS/SS/FF/SF
    - ii. Mandatory/discretionary/external
  - c. Leads and Lags
4. Building the project 'Road Map'
5. **Exercise #1 – Construct Schedule.**
6. Problems with links
  - a. Progressive feed - Ladders
7. Additional Resources:
  - a. Appendix 1: Good Scheduling Practice
  - b. Appendix 2: Dynamic Scheduling
  - c. Appendix 3: Links Lags and Ladders
  - d. Key papers & links:
    - i. For more on Stakeholder Management see - [www.stakeholder-management.com](http://www.stakeholder-management.com)
    - ii. Communication in organisations: making the schedule effective: [http://www.mosaicprojects.com.au/Resources\\_Papers\\_090.html](http://www.mosaicprojects.com.au/Resources_Papers_090.html)
    - iii. The Cost of Time (Durations) [http://www.mosaicprojects.com.au/Resources\\_Papers\\_009.html](http://www.mosaicprojects.com.au/Resources_Papers_009.html)

### Session 2: Major Project Schedules

1. Understanding the Project
  - a. Project scope & Objectives
2. Project Planning
  - a. Strategy and methods
3. Schedule Design
  - a. Optimum update cycle
  - b. Rolling Wave planning and Schedule Density
  - c. Gateways and phasing / project life cycle
  - d. Schedule Levels
  - e. Managing multiple schedules

## Scheduling 2 Day Structure

4. Project Breakdown Structures
  - a. OBS, CBS, RBS
  - b. Work Breakdown Structure
5. **Exercise #2 – Develop a Work Breakdown Structure.**
6. Additional Resources:
  - a. Appendix 4: Schedule Levels
  - b. Books
    - i. PMI Practice Standard for WBS  
[www.pmi.org](http://www.pmi.org)
  - c. Key papers:
    - i. Project Controls in the C21 – What works / What's fiction  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_083.html](http://www.mosaicprojects.com.au/Resources_Papers_083.html)

### Session 3: Schedule Analysis

1. Basic Critical Path calculations (Time Analysis)
  - a. Forward Pass
  - b. Back Pass
2. **Exercise #3 – Analyse Schedule.**
3. Free Float, Total Float & the Critical Path
  - a. Defining the Critical Path
  - b. Float calculations and definitions
  - c. Using float wisely
  - d. Integers -v- elapsed time
4. Calculating Durations
  - a. Options: Analogous -v- Parametric
  - b. Problems with production rates
  - c. Problems with effort driven durations
5. Constraints
  - a. Date constraints
  - b. External constraints
6. Scheduling Heuristics & Templates
  - a. Guide to good practice (Scheduling Guides and Standards)
  - b. Templates, Fragnets and Subprojects
7. Additional Resources:
  - a. Appendix 5: Schedule Float
  - b. Key papers:
    - ii. Float - Is It Real?  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_043.html](http://www.mosaicprojects.com.au/Resources_Papers_043.html)
    - iii. Calculating and Using Float  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_110.html](http://www.mosaicprojects.com.au/Resources_Papers_110.html)

## Scheduling 2 Day Structure

### Session 4: Scheduling History, Uncertainty & Risk Management

1. History of scheduling
  - a. Barcharts, Milestone Charts and OR
  - b. ADM / PDM / PERT
2. Confidence levels
3. What-if scenarios
4. PERT and Monte Carlo
  - a. PERT Analysis
  - b. Normal, Beta and Triangular distributions
  - c. PERT Merge Bias
  - d. Monte Carlo Analysis
  - e. Loops and Conditional Branches
5. **Exercise #4 – PERT Calculations.**
6. Risk Management
7. Logic and Duration issues
8. Probability and contingency
  - a. Normal variability
  - b. Risk Events (contingencies)
  - c. Buffers & management reserves (Unknown unknowns)
9. Additional Resources:
  - a. Key papers:
    - i. A Brief History of Scheduling  
[www.mosaicprojects.com.au/Resources\\_Papers\\_042.html](http://www.mosaicprojects.com.au/Resources_Papers_042.html)
    - ii. The Origins of Modern Project Management  
[www.mosaicprojects.com.au/Resources\\_Papers\\_050.html](http://www.mosaicprojects.com.au/Resources_Papers_050.html)
    - iii. See, Float – Is it Real?  
[www.mosaicprojects.com.au/Resources\\_Papers\\_043.html](http://www.mosaicprojects.com.au/Resources_Papers_043.html)
    - iv. The Meaning of Risk in an Uncertain World  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_040.html](http://www.mosaicprojects.com.au/Resources_Papers_040.html)

## Day 2

### Session 5: Resource Analysis and Costs

1. What is a resource
  - a. Cost – using resources incurs costs
  - b. Capability – resources do the work
  - c. Stakeholder / team member – need communication and motivation
2. Types of resource
  - a. People and equipment
  - b. Materials and consumables
  - c. Money and work space

## Scheduling 2 Day Structure

3. Resource allocation and constraints
  - a. Availability / calendars / limitations
  - b. Allocation Per day (time based) or Total (distributed or flexible)
4. Resource levelling options
  - a. Aggregation
  - b. Smoothing
  - c. Levelling
5. **Exercise 5 – Resource level Schedule.**
6. Resource problems
  - a. Resource schedule
    - i. No float – balanced by resource allocation
    - ii. Critical resources & resource float
  - b. Productivity
    - i. Multi-tasking
7. Schedule compression
  - a. Crashing (Mythical Man Month)
  - b. Fast tracking
8. Cash flow analysis
  - a. Developing the baseline budget
  - b. Types of cash flow
  - c. The Funding gap
9. Additional Resources:
  - a. Key papers:
    - i. Cost Engineering is an Oxymoron!  
<http://mosaicprojects.wordpress.com/2010/05/13/cost-management-is-an-oxymoron>

### Session 6: Updating the Schedule & Reporting

1. Managing for success
2. Schedule baselines
  - a. Contract Programs (old and new views)
  - b. Schedule Baselines
3. Statusing the schedule - Gathering and recording actuals
  - a. Who to ask
  - b. Data to collect
    - i. Start and Finish dates
    - ii. Time to finish and % work complete
    - iii. Resources used and Costs incurred
  - c. Statusing and editing for accuracy

## Scheduling 2 Day Structure

4. Updating the schedule
  - a. Review status
  - b. Management action to
    - i. Lock in gains
    - ii. Mitigate losses
5. **Exercise #6 – Update the Schedule.**
6. Reporting options and communication
  - a. Focusing the information
  - b. Coding structures
  - c. Standardising report formats
7. Types of Report
  - a. Management Reports – Milestone and Dashboards
  - b. Team reports – Bar charts
  - c. Variance and trend reports
8. Roles and responsibilities
  - a. The project scheduler
    - i. Attributes of a Scheduler
  - b. Task owners / Team members
  - c. The project manager, clients and senior managers
  - d. Dealing with 'Bad News'
  - e. Why this process works
9. Additional Resources:
  - a. Key papers:
    - i. Managing the Risk of Delayed Completion in the 21st Century  
[http://www.mosaicprojects.com.au/PDF/CIOB\\_TM\\_report\\_full.pdf](http://www.mosaicprojects.com.au/PDF/CIOB_TM_report_full.pdf)
    - ii. Managing for Success - The power of regular updates  
[www.mosaicprojects.com.au/Resources\\_Papers\\_002.html](http://www.mosaicprojects.com.au/Resources_Papers_002.html)
    - iii. Seeing the Road Ahead - the challenge of communicating schedule data  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_106.html](http://www.mosaicprojects.com.au/Resources_Papers_106.html)
    - iv. Communication in organisations: making the schedule effective  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_090.html](http://www.mosaicprojects.com.au/Resources_Papers_090.html)
    - v. Project management vs Project scheduling  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_107.html](http://www.mosaicprojects.com.au/Resources_Papers_107.html)

### Session 7: Scheduling Tools Techniques & Emerging Methods

1. Software tools
  - a. EPM focus
  - b. Project focus
  - c. Presentation focused GUI's
2. Line of Balance & Chainage Charts
3. **Exercise #7 – Develop a LOB Chart.**
4. Multi-Activity Charts
5. Emerging ideas

## Scheduling 2 Day Structure

- a. RDM
- b. Momentology
- c. Complexity Theory
6. The schedule as a motivator
  - a. Gaining commitment
  - b. Critical Chain / Viper
  - c. Motivation
  - d. The psychology behind the process
7. Additional Resources:
  - a. Key papers:
    - i. The Origins of Modern Project Management  
[www.mosaicprojects.com.au/Resources\\_Papers\\_050.html](http://www.mosaicprojects.com.au/Resources_Papers_050.html)
    - ii. For more on the 'VIPER Experience' see -  
[www.mosaicprojects.com.au/Resources\\_Papers\\_012.html](http://www.mosaicprojects.com.au/Resources_Papers_012.html)
    - iii. Scheduling in the Age of Complexity  
[www.mosaicprojects.com.au/Resources\\_Papers\\_089.html](http://www.mosaicprojects.com.au/Resources_Papers_089.html)

### Session 8: Managing Scheduling & Allied processes

1. The role of a PMO
  - a. Types of PMO
  - b. PjMO, PgMO, PtMO roles and responsibilities
2. Data management
  - a. Version control
  - b. Change management
  - c. Photo diaries & records
3. Schedule assessment
  - a. PMI Practice Standard for Scheduling
  - b. The CIOB: *Guide to Good Practice in the Management of Time in Complex Projects*
4. Dispute management
  - a. The Delay and disruption Protocol
  - b. Delay analysis options
5. Allied processes
  - a. WBS / OBS / Control Accounts / Work Packages
  - b. Earned Value
    - a. Planned Value
    - b. Actual Cost
    - c. Earned Value
    - d. Variance identification and reporting
    - e. Forecast to Complete and At completion,
    - f. TCPI and trend analysis
  - c. Earned Schedule

## Scheduling 2 Day Structure

6. Exercise #8 The Value of Teamwork
  7. Summary & Course wrap Up.
  8. Additional Resources:
    - a. Appendix 6: Attributes of a Scheduler
    - b. Mosaic's planning home page:  
<http://www.mosaicprojects.com.au/Planning.html>
    - c. Key papers:
      - i. Papers on PMOs:  
[www.mosaicprojects.com.au/Resources\\_Papers.html#Proj\\_Off](http://www.mosaicprojects.com.au/Resources_Papers.html#Proj_Off)
      - ii. Assessing Delay and Disruption - Tribunals Beware -  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_035.html](http://www.mosaicprojects.com.au/Resources_Papers_035.html)
      - iii. Earned Value - An Introduction to the Basic Principals  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_006.html](http://www.mosaicprojects.com.au/Resources_Papers_006.html)
      - iv. Earned Value Business Management  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_006a.html](http://www.mosaicprojects.com.au/Resources_Papers_006a.html)
      - v. The Project Start-Up Conundrum  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_003.html](http://www.mosaicprojects.com.au/Resources_Papers_003.html)
      - vi. Why CPM is wildly optimistic -  
[http://www.mosaicprojects.com.au/Resources\\_Papers\\_117.html](http://www.mosaicprojects.com.au/Resources_Papers_117.html)
    - b. Books & Standards: [www.mosaicprojects.com.au/Books.html](http://www.mosaicprojects.com.au/Books.html)
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### Scheduling Core Papers

#1	A Guide to Scheduling Good Practice	<a href="http://www.mosaicprojects.com.au/PDF/Good_Scheduling_Practice.pdf">http://www.mosaicprojects.com.au/PDF/Good_Scheduling_Practice.pdf</a>
#2	Attributes of a Scheduler	<a href="http://www.mosaicprojects.com.au/PDF/Attributes_of_a_Scheduler.pdf">http://www.mosaicprojects.com.au/PDF/Attributes_of_a_Scheduler.pdf</a>
#3	Dynamic Scheduling	<a href="http://www.mosaicprojects.com.au/PDF/dynamic_scheduling.pdf">http://www.mosaicprojects.com.au/PDF/dynamic_scheduling.pdf</a>
#4	Links, Lags & Ladders	<a href="http://www.mosaicprojects.com.au/PDF/Links_Lags_Ladders.pdf">http://www.mosaicprojects.com.au/PDF/Links_Lags_Ladders.pdf</a>
#5	Schedule Float	<a href="http://www.mosaicprojects.com.au/PDF/Schedule_Float.pdf">http://www.mosaicprojects.com.au/PDF/Schedule_Float.pdf</a>
#6	Schedule Levels	<a href="http://www.mosaicprojects.com.au/PDF/Schedule_Levels.pdf">http://www.mosaicprojects.com.au/PDF/Schedule_Levels.pdf</a>

Mosaic's Scheduling Home Page is at : <http://www.mosaicprojects.com.au/Planning.html>