

# Course Outline

## TEC D 205 – Engineering Tech Project Planning

Olympic College – Bremerton, WA

### **Week 1 – Chapter 4: “DEFINING THE PROJECT”**

1. Step one: Defining the Project Scope
  - A. Employing a Project Scope Checklist
    1. Project objective
    2. Deliverables
    3. Milestones
    4. Technical requirements
    5. Limits and exclusions
    6. Review with customer
2. Step two: Establishing Project Priorities
3. Step three: Creating the Work Breakdown Structure
  - A. Major groupings found in a WBS
  - B. How WBS helps the Project Manager
  - C. WBS Development
4. Step four: Integrating the WBS with the Organization
5. Step five: Coding the WBS for the Information System
6. Responsibility Matrices
7. Project Communication Plan
8. Summary

### **Week 2 – Chapter 1: “MODERN PROJECT MANAGEMENT”**

1. What is a Project?
  - A. What a project is not
  - B. Project life cycle
  - C. The project manager
2. The importance of Project Management
  - A. Compression of product life cycle
  - B. Knowledge explosion
  - C. Triple Bottom Line (planet, people, profit)
  - D. Corporate downsizing
  - E. Increased customer focus
  - F. Small projects represent big problems
3. Project Management today—an integrative approach
  - A. Integration of projects with Organizational Strategy
  - B. Integration of projects through Portfolio Management
  - C. Integration of the Processes of Implementing Actual Projects
4. Summary

**Week 3 – Chapter 2: “ORGANIZATION STRATEGY AND PROJECT SELECTION”**

1. The Strategic Management Process: An Overview
  - A. Four activities of the Strategic Management Process
    1. Review and Define the Organizational Mission
    2. Set Long Range Goals and Objectives
    3. Analyze and formulate strategies to reach objectives
    4. Implement strategies through projects
2. Scenario Planning: A Supplement to Traditional Strategic Planning
  - A. Overview
  - B. Scenario Planning Process
  - C. Assessing your Core Business and Industry
  - D. Potential Scenarios and Impact
  - E. Potential Strategies
  - F. Triggers
2. The need for an effective Project Portfolio Management System
  - Problem 1: The Implementation gap
  - Problem 2: Organizational politics
  - Problem 3: Resource conflicts and multitasking
3. A Portfolio Management System
  - A. Classification of the project
  - B. Financial Criteria
  - C. Non-Financial Criteria
4. Applying a Selection Model
  - A. Sources and solicitation of project proposals
  - B. Ranking proposals and selection of projects
5. Managing the Portfolio System
  - A. Balancing the portfolio for risks and types of projects
6. Summary

Appendix 2.1 Request for Proposal (RFP)

**Week 4 – Chapter 3: “ORGANIZATION: STRUCTURE AND CULTURE”**

1. Project Management Structures
  - A. Organizing Projects within the Functional Organization
  - B. Organizing Projects as Dedicated Teams
  - C. Projectized Organization
  - D. Organizing Projects within a Matrix Arrangement
  - E. Different Matrix Forms
    1. Weak matrix
    2. Balanced matrix
    3. Strong matrix
2. What is the right Project Management Structure?
  - A. Organizational considerations
  - B. Project considerations
3. Organization Culture
  - A. What is organizational culture?
  - B. Identifying cultural characteristics
4. Implication of Organization Culture for Organizing Projects
5. Summary

**Week 5 – Chapter 5: “ESTIMATING PROJECT TIMES AND COST”**

1. Factors influencing the Quality of Estimates
  - A. Planning horizon
  - B. Project duration
  - C. People
  - D. Project structure and organization
  - E. Padding estimates
  - F. Organization culture
  - G. Other factors
2. Estimating guidelines for Times, Costs, and Resources
3. Top-down versus bottom-up estimating
4. Methods for estimating project times and costs
  - A. Top-down approaches for estimating project times and costs
    1. Consensus methods
    2. Ratio methods
    3. Apportion method
    4. Function point methods
    5. Learning curves
  - B. Bottom-up approaches for estimating project times and costs
    1. Template method
    2. Parametric procedures
    3. Range Estimating
  - C. A hybrid: Phase estimating
5. Level of Detail
6. Types of Costs
  - A. Direct costs
  - B. Direct overhead costs
  - C. General and administrative overhead costs
8. Refining Estimates
9. Creating a Data Base for Estimating
10. Summary

Appendix 5.1 Learning Curves for Estimating

**Week 6 – Chapter 6: “DEVELOPING A PROJECT PLAN”**

1. Developing the Project Network
2. From Work Package to Network
3. Constructing a Project Network
  - A. Terminology
  - B. Two approaches
  - C. Basic rules to follow in developing project networks
4. Activity-on-node(AON)fundamentals
5. Network Computation Process
  - A. Forward pass—earliest times
  - B. Backward pass—latest times
  - C. Determining slack
  - D. Free slack (float)
6. Using the forward and backward pass information
7. Level of detail for activities
8. Practical considerations
  - A. Network logic errors
  - B. Activity numbering

- C. Use of computer to develop networks
- D. Calendar dates
- E. Multiple starts and multiple projects
- 9. Extended network techniques to come closer to reality
  - A. Laddering
  - B. Use of lags
    - 1.) Finish-to-start relationship
    - 2.) Start-to-start relationship
    - 3.) Finish-to-finish relationship
    - 4.) Start-to-start relationship
    - 5.) Combinations of relationships
  - C. An example using lag relationships--the forward and backward pass
  - D. Hammock activities
- 10. An example using lag relationships--the forward and backward pass
- 11. Hammock activities
- 12. Summary

### **Week 7 – Chapter 7: “MANAGING RISK”**

- 1. Risk Management Process
- 2. Step 1: Risk Identification
- 3. Step 2: Risk Assessment
  - A. Scenario Analysis
  - B. Probability analysis
- 4. Step 3: Risk Response Development
  - A. Mitigating risk
  - B. Avoiding
  - C. Transferring risk
  - D. Sharing risk
  - E. Retaining risk
- 5. Contingency Planning
  - A. Technical risks
  - B. Schedule risks
  - C. Cost risks
  - E. Funding risks
- 6. Opportunity Management
- 7. Contingency Funding and Time Buffers
  - A. Budget reserves
  - B. Management reserves
  - C. Time buffers
- 8. Step 4: Risk Response Control
- 8. Change Control Management
- 9. Summary
- Appendix 7.1: PERT and PERT simulation
  - A. Program Evaluation Review Technique (PERT)
  - B. A hypothetical PERT example

### **Week 8 – Chapter 8: “SCHEDULING RESOURCES AND COST”**

- 1. Overview of the Resource Scheduling Problem
- 2. Types of Resource Constraints
- 3. Classification of a Scheduling Problem
- 4. Resource Allocation Methods
  - A. Assumptions

- B. Time constrained projects: smoothing resource demand
- C. Resource-constrained projects
- 5. Computer Demonstration of Resource-Constrained Scheduling
  - A. The Impacts of Resource-Constrained Scheduling
- 6. Splitting Activities
- 7. Benefits of Scheduling Resources
- 8. Assigning Project Work
- 9. Multi-project Resource Schedules
- 10. Using the Resource Schedule to Develop a Project Cost Baseline
  - A. Why a time-phased budget baseline is needed
  - B. Creating a time-phased budget
- 11. Summary
- 12. Appendix 8.1: The critical-chain approach
  - A. Time estimates
  - B. Critical-chain in action
  - C. Critical-chain versus traditional scheduling approach
  - D. CCPM and splitting tasks
  - E. Monitoring project performance
  - F. CCPM method today

### **Week 9 – Chapter 13: “PROGRESS AND PERFORMANCE MEASUREMENT AND EVALUATION”**

- 1. Structure of a Project Monitoring Information System
- 2. The Project Control Process
  - A. Step 1: Setting a baseline plan
  - B. Step 2: Measuring progress and performance
  - C. Step 3: Comparing plan against actual
  - D. Step 4: Taking action
- 3. Monitoring Time Performance
  - A. Tracking Gantt chart
  - B. Control Chart
- 4. Development of an Earned Value Cost/Schedule System
  - A. What Costs are included in Baselines?
  - B. Methods of Variance Analysis
- 5. Developing a status report: a hypothetical example
  - A. Assumptions
  - B. Baseline Development
  - C. Development of a Status Report
- 6. Indexes to Monitor Progress
  - A. Performance Indexes
  - B. Percent Complete Indexes
  - C. Technical Performance Measurement
  - D. Software for Project Cost/Schedule Systems
  - E. Additional Earned Value Rules
- 7. Forecasting Final Project Cost
- 8. Other Control Issues
  - A. Scope creep
  - B. Baseline changes
  - C. The Costs and Problems of Data Acquisitions
- 9. Summary

Appendix 13.1: The application of additional earned value rule

Appendix 13.2: Obtaining project performance information from MS Project

**Week 10 – Chapter 14: “PROJECT CLOSURE”**

1. Types of Closure
  - A. Normal
  - B. Premature
  - C. Perpetual
  - D. Failed project
  - E. Changed priority
2. Wrap-up Closure Activities
3. Three Major Deliverables
4. Post Implementation Evaluation
  - A. Team Evaluation
  - B. Individual team member and project manager performance reviews
5. Retrospectives
  - A. Why retrospectives?
  - B. Initiating the retrospective review
  - C. Use of an Independent Facilitator
  - D. Selection of a Facilitator
  - E. Roles of a Facilitator
  - F. Managing a retrospective
  - G. Overseeing a post-project retrospective
  - H. Utilization of retrospectives
  - I. Archiving retrospectives
  - J. Concluding retrospective notes
6. Summary