LECTURE NOTES
ON
PROJECT MANAGEMENT

Emad Elbeltagi, Ph.D., P.Eng.,
Professor of Construction Engineering and Management
Civil Engineering Department  
Mansoura Higher Institute for Engineering and Technology

Project Management (IEN314)

Syllabus:
Project management overview, organizational structures, assessing success, planning, learning curves, network scheduling techniques, CPM analysis, precedence networking, resources allocation and constraints, cost management, risk management, project performance management and control.

Objectives:
This course focuses on the principles of project management including some areas of the project management knowledge such as: time management; cost management and risk management. This course, also, introduces the planning, scheduling and project control techniques. Human resources management and the organizational structures are introduced. The course focuses on:

- Project life cycle
- Delivery approaches
- Cost management
- Human resources management
- Organizational structures
- Learning theory
- Project planning
- Project scheduling
- Resources management
- Risk management

Lectures
Sundays: 9:00 – 10:30 AM  
10:30 AM – 12:00 PM

Tutorials
As per the announced schedule

Instructor
Prof. Emad Elbeltagi  
Office: B241
Web page: http://osp.mans.edu.eg/elbeltagi
E-mail: eelbelta@mc.edu.eg & eelbelta@yahoo.com

Teaching assistant
Eng. Mohamed Elbaz
# TABLE OF CONTENTS

1. **CHAPTER 1: INTRODUCTION**
   
   1.1 The Need for Project Management
   
   1.2 The Project
   
   1.3 The Project Scope and Goals
   
   1.4 The Project Life-Cycle
      
      1.4.1 Pre-execution phase
      
      1.4.2 Procurement phase (Bidding and award phase)
      
      1.4.3 Execution Phase
      
      1.4.4 Closeout Phase
   
   1.5 **Major Types of Construction Projects**
      
      1.5.1 Residential Housing Construction
      
      1.5.2 Institutional and Commercial Building Construction
      
      1.5.3 Specialized Industrial Construction
      
      1.5.4 Infrastructure and Heavy Construction
   
   1.6 **Construction Projects Participants**
      
      1.6.1 The Owner (Client)
      
      1.6.2 The Design Professionals
      
      1.6.3 The Construction Professionals
      
      1.6.4 The Project Manager
   
   1.7 Projects Stakeholders
   
   1.8 Case Study
   
   1.8 Exercises
2. CHAPTER 2: CONTRACT STRATEGY

2.1 What is a Contract

2.2 Selection of Contract Type
   2.2.1 Project Objectives
   2.2.2 Project Constraints

2.3 Project Delivery Methods
   2.3.1 Traditional Approach
   2.3.2 Direct Labor
   2.3.3 Design-Build
   2.3.4 Build-Operate-Transfer (BOT)
   2.3.5 Professional Construction Management (PCM)
   2.3.6 Contractual Relationships

2.4 Types of Contracts
   2.4.1 Lump-sum Contract
   2.4.2 Admeasurement Contract
   2.4.3 Cost-reimbursable Contract (cost-plus contract)
   2.4.4 Target Cost Contract
   2.4.5 Time and Material (T&M) Contract

2.5 Contract Administration
   2.5.1 Contract Documents
   2.5.2 Conditions of Contract
   2.5.3 The Standard (general) Forms of Conditions of Contract
   2.5.4 Special Conditions of Contract
   2.5.5 Construction claims Contract

2.6 Selecting the Contractor

2.7 Sub-Contracting

2.8 Exercises
3. CHAPTER 3: HUMAN RESOURCES MANAGEMENT

3.1 What is Human Resources Management (HRM)?

3.2 Organizational Structures
   3.2.1 Functional Organization Structure
   3.2.2 Project Organization Structure
   3.2.3 Matrix Organization Structure

3.3 Human Resources Management Plan
   3.3.1 Develop HR Plan
   3.3.2 Acquire Project Team
   3.3.3 Develop Project Team
   3.3.4 Manage Project Team

3.4 Exercises

4. CHAPTER 4: PROJECT PLANNING AND SCHEDULING

4.1 Introduction

4.2 Project Planning Steps
   4.2.1 Work Breakdown Structure (WBS)
   4.2.2 Project Activities
   4.2.3 Activities Relationships
   4.2.4 Drawing Project Network

4.3 The Critical Path Method

4.4 Calculations for the Critical Path Method

4.5 Schedule Presentation

4.6 Criticisms to Network Techniques

4.7 Solved Examples

4.8 Exercises
5. CHAPTER 5: LEARNING THEORY

5.1 Introduction
5.2 Productivity
5.3 Learning Models Assumption
5.4 Factors Affecting Learning Rates
5.5 Variability of Learning Curve

5.6 Learning Models
   5.6.1 Straight-Line Model
   5.6.2 Stanford "B" Model
   5.6.3 Cubic Model
   5.6.4 Piecewise (or Stepwise) Model
   5.6.5 Exponential Model

5.7 Models Data Representation in Learning Curve Theory
5.8 Example
5.9 Comparison between Data Representing Methods
5.10 Using Learning Curves to Predict Future Performance
5.11 Forgetting Phenomenon
5.12 Exercises

6. CHAPTER 6: COST ESTIMATING

6.1 Purpose of Estimating
6.2 Types of Cost Estimating
6.3 Conceptual Cost Estimating Basics
6.4 Broad Scope of Conceptual Estimates

6.5 Conceptual Estimate Adjustment
   6.5.1 Adjustment for time
   6.5.2 Adjustment for location
   6.5.3 Adjustment for Size
   6.5.4 Combined Adjustment
   6.5.2 Unit Cost Adjustment

6.6 Conceptual Estimating Techniques
   6.6.1 Interpolation
6.6.2 Unit Method
6.6.3 Superficial Method

6.7 Detailed Estimate of Direct Costs
   6.7.1 Unit Rate Estimating
   6.7.2 Operational Estimating

6.8 Estimating Indirect Cost
   6.8.1 Site Overheads
   6.8.2 General Overheads
   6.8.3 Contingences
   6.8.4 Contractor/Subcontractor profits

6.9 Finalizing a Tender Price
   6.9.1 Balanced bid (straight forward method)
   6.9.2 Unbalanced bid (loading of rates)

6.10 Exercises

7. CHAPTER 7: RISK MANAGEMENT

7.1 Introduction

7.2 Risk Management Process
   7.2.1 Risk Identification
   7.2.2 Risk Analysis
   7.2.3 Risk Responses
   7.2.4 Risk Control

7.3 Program Evaluation and Review Technique (PERT)

7.8 Exercises
<table>
<thead>
<tr>
<th>Week #</th>
<th>Date</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25/9/2016</td>
<td>Overview</td>
</tr>
<tr>
<td>2</td>
<td>2/10/2016</td>
<td>Holiday</td>
</tr>
<tr>
<td>3</td>
<td>9/10/2016</td>
<td>Project definition, scope and objectives</td>
</tr>
<tr>
<td>4</td>
<td>16/10/2016</td>
<td>Human resources management</td>
</tr>
<tr>
<td>5</td>
<td>23/10/2016</td>
<td>Human resources management</td>
</tr>
<tr>
<td>6</td>
<td>30/10/2016</td>
<td>Procurement methods</td>
</tr>
<tr>
<td>7</td>
<td>6/11/2016</td>
<td>Procurement methods</td>
</tr>
<tr>
<td>8</td>
<td>13/11/2016</td>
<td>Mid-term Exam</td>
</tr>
<tr>
<td>9</td>
<td>20/11/2016</td>
<td>Cost management</td>
</tr>
<tr>
<td>10</td>
<td>27/11/2016</td>
<td>Cost management</td>
</tr>
<tr>
<td>11</td>
<td>4/12/2016</td>
<td>Risk management</td>
</tr>
<tr>
<td>12</td>
<td>11/12/2016</td>
<td>Risk management</td>
</tr>
<tr>
<td>13</td>
<td>18/12/2016</td>
<td>Risk management</td>
</tr>
<tr>
<td>14</td>
<td>25/12/2016</td>
<td>Risk management</td>
</tr>
</tbody>
</table>
REFERENCES


