

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



ENGINEERING MANAGEMENT

(GE 404)

1

LECTURE #1

Course Description and Introduction

Contents

- Objectives of the present lecture
- About the Instructor
- Course Description
- Course Learning Outcomes (CLO)
- Outcome Assessment
- Project Definition
- Characteristics of a Project
- Management and its functions
- Levels of Management
- Project Management
- Project Management Institute
- Main Resources
- Project Stake Holders
- Critical success factors
- Assessing success of the Project
- A Real life application
- Further reading

Objectives of the Present lecture

3

- *To provide an overview of the course contents*
- *To discuss the course learning outcomes*
- *To give an overview of Project Management*

About the Instructor

4

Name: **Dr. Fahad K. Bin wo'lah**

Designation: Assistant **Professor**

Department: Civil Engineering

Office: **2A14**

Tel: **46-77022**

Email: bfahad@ksu.edu.sa

Website: <http://fac.ksu.edu.sa/bfahad>

Office Hours: Displayed on the office wall.

Course Description

5

- Introduction to project management objectives
- **Project participants and project life cycle**
- **Planning engineering projects**
- Scheduling using activity-on-node and precedence methods
- **Resource leveling and allocation**
- **Project time-cost trade-off**
- **Updating construction schedules**
- **Project time and cost control**
- **Contractual and organizational approaches including definition of organizational responsibilities of project participants**

Text Book

6

Project Management with CPM, PERT, and Precedence Diagramming

by

J. J. Moder
C. R. Philips
and
E.W. Davis

Edition: Third

Publisher:

VAN NOSTRAND REINHOLD COMPANY, NY

PROJECT MANAGEMENT with CPM, PERT and Precedence Diagramming

THIRD EDITION

Joseph J. Moder

*Professor, Department of Management Science and Computer
Information Systems, University of Miami*

Cecil R. Phillips

Vice President, Kurt Salmon Associates, Inc.

Edward W. Davis

*Professor, Colgate Darden Graduate School of Business
Administration, University of Virginia*



VAN NOSTRAND REINHOLD COMPANY
New York

Other Book

7

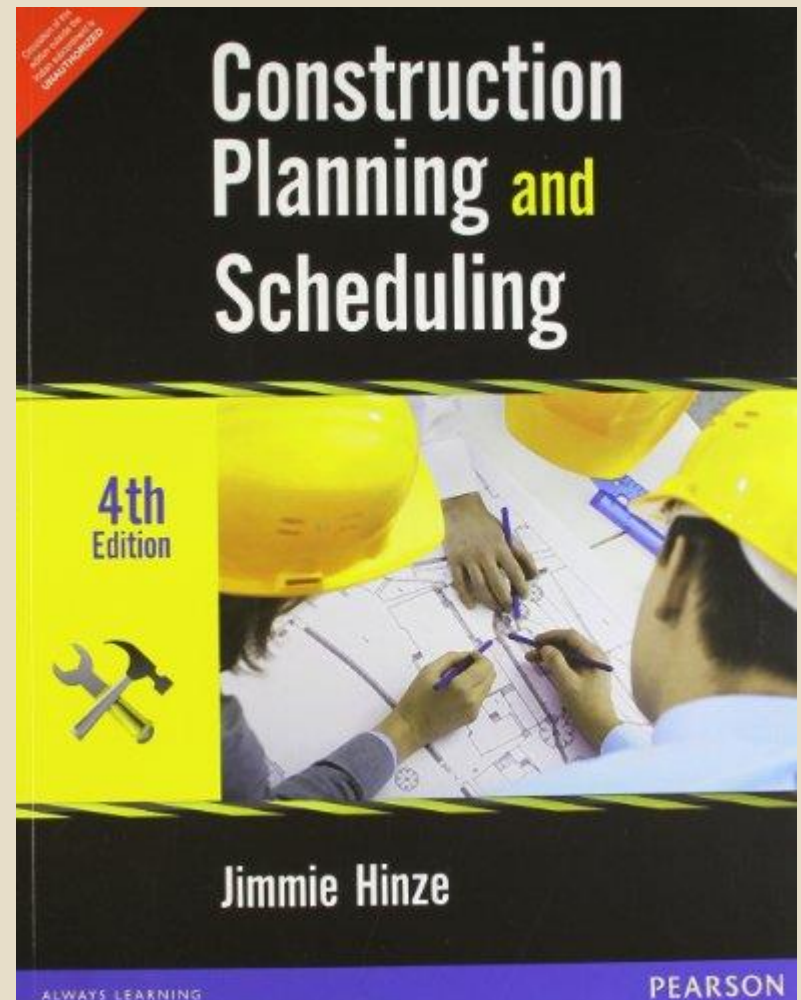
Construction Planning and Scheduling

by

Jimmie Hinze

Edition: Fourth

Publisher: Pearson, 2011



Course Learning Outcomes

8

Students completing this course successfully will be able to:

- Use bar chart technique to formulate a complete plan for a project
- Apply activity-on-node network, and precedence diagram to schedule a project
- Level and allocate project resources
- Shorten project duration
- Monitor an engineering project for purpose of time and cost control
- Use computer software for preparing project schedules
- Understand principles of project organization and contractual relationships

Outcome Assessment

9

- Two Midterm Exams 50%
- Homeworks and Quizzes 10%
- Final Exam 40%

Course Syllabus

10



KingSaud University
College of Engineering
Department of Civil Engineering

GE 404: ENGINEERING MANAGEMENT 1st Semester 1439/1440H (2018/2019)

Dr. Abdulmohsen Almohsen; Dr. Fahad Bin Wo'lah; Dr. Ayman Altuwaim

No	Topic	Reading Assignment	Duration "Weeks"
INTRODUCTION & PROJECT ORGANIZING			
1a	Introduction for Engineering Management	Ch. 1 & Class Notes	1
1b	Project Participants and Project Life Cycle	Class Notes	0.5
2	Contractual and Organizational Approaches	Ch. 1 & Class Notes	0.5
PROJECT PLANNING			
3	Project Time Planning: • Processes, and • Bar (Gantt) Chart	Ch. 1	1
4	Network Model: • Activity-On-Node (AON), • Precedence Diagramming, and • Time scaled network	Ch. 2 (pp. 37-43) Ch. 4 (pp. 93-107)	2
5a	Resource Leveling and Allocation	Ch. 7 (pp. 191-210)	1.5
5b	Resource Allocation	Class Note	1
6	Time Control	Ch. 5 (pp. 133-163) & Class Notes	1
7	Time-Cost Trade-Offs	Ch. 8 (pp. 237-249)	1.5
PROJECT FINANCING AND CONTROL			
8a	Financial Management: Cashflow Forecasting	Class Notes	1.5
8b	Cost Control	Ch. 5 (pp. 133-163) & Class Notes	1
9	Analysis of Scheduling Delay	Class Notes	1.5

Textbook: Project Management with CPM, PERT, and Precedence Diagramming, 3rd Edition, by Moder J., Phillips, C., and Davis, E.

Grading: Mid-term Exams 50%
Assignments and Quizzes 10%
Final Examination 40%

Mid Term Exams:

First Mid-Term	Saturday (Week 8)	27 October 2018	1:00 – 2:45 pm
Second Mid-Term	Saturday (Week 12)	01 December 2018	1:00 – 2:45 pm

Project Definition

11

- A *project* is a set of tasks or activities related to the achievement of some planned objective
- Other Definitions:
 - A project is a temporary endeavor undertaken to create a unique product or service or result (PMI)
 - A combination of human and non-human resources pooled together to achieve a specific purpose and deliverables
 - A project is a one-shot, time-limited, goal-directed, major undertaking requiring the commitment of varied skills and resources



Characteristics of a Project

12

- A project has a unique purpose
- A project is temporary
- A project requires resources
- A project has a primary sponsor or customer
- A project involves uncertainty

Examples of Projects

13

- Construction of building and infrastructure
 - Villas; Malls; Hospitals; Dams; Tunnels; Bridges; power plants; Refineries etc.
- Development of a software product
 - Software for the registration of students in the university
- Manufacturing of Aircrafts
 - Commercial plane; cargo planes; Fighter planes etc.

Management and its Functions

14

- Management is a process concerned with the achievement of goals or objectives. It includes:
 - Planning - deciding what is to be done
 - Organizing – (implementation) making arrangements
 - Staffing - selecting the right people for the job
 - Leading/Directing - giving instructions
 - Controlling/Monitoring - checking progress against plans and taking actions to remedy hold ups



Note: *Motivating* is also considered one of the functions of management, because without motivation, employees cannot work effectively.

Levels of Management

15

The main levels of management are:

- Top level
- Middle level
- Lower/Supervisory level

Levels of Management (Contd.)

16

- **Top Level Management**

- The managers working at this level have **maximum authority**.
- It includes group of crucial persons essential for leading and directing the efforts of other people. For example, Managing Director, General Manager, President, Vice President, Chief Executive Officer (C.E.O.) etc.

- **Middle Level Management**

- This level of management consists of departmental heads such as purchase department head, sales department head, marketing manager etc.
- People of this group are **responsible for executing the plans and policies made by top level**.

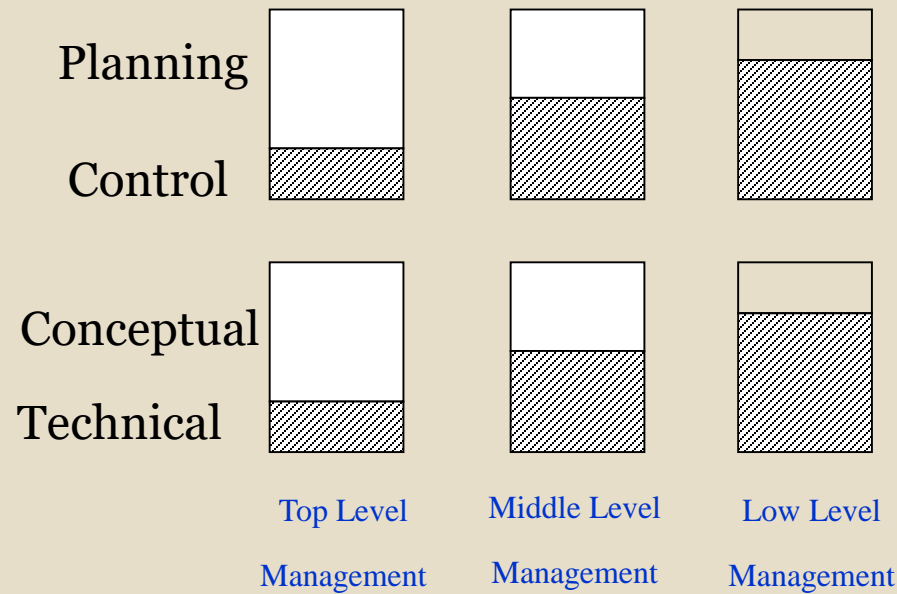
- **Low Level Management**

- Their **authority is limited**. The **quality and quantity of output depends upon the efficiency of this level of managers**.
- Managers of this group **actually carry on the work or perform the activities according to the plans of top and middle level management**. Supervisors, clerks etc. come under this group.
- They **pass on the instruction to workers and report to the middle level management**.

Involvement % of the different levels of management

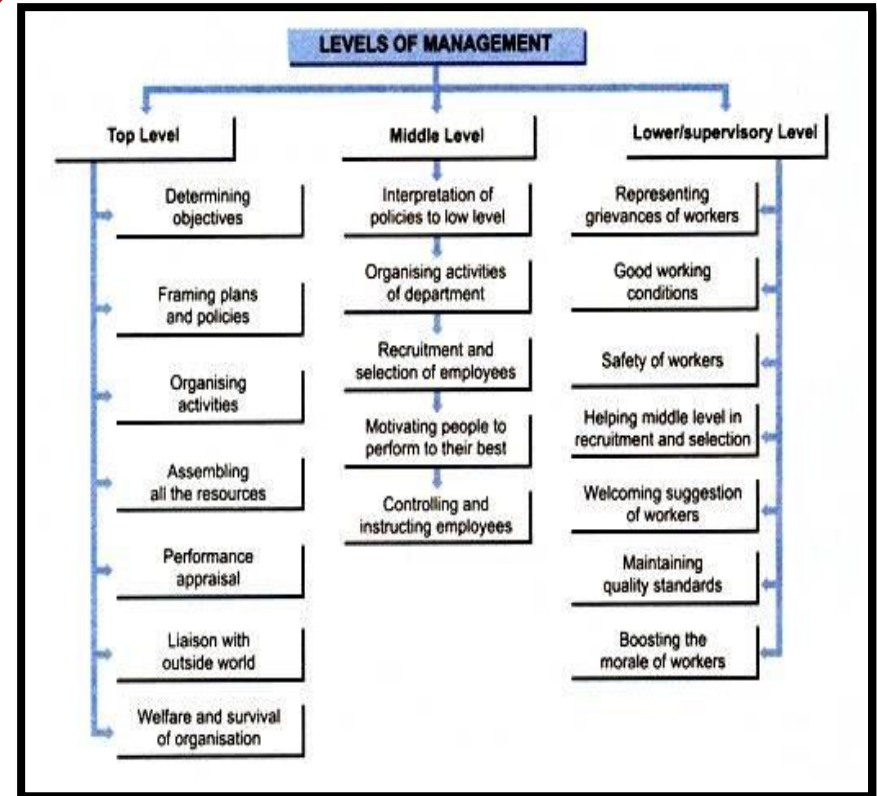
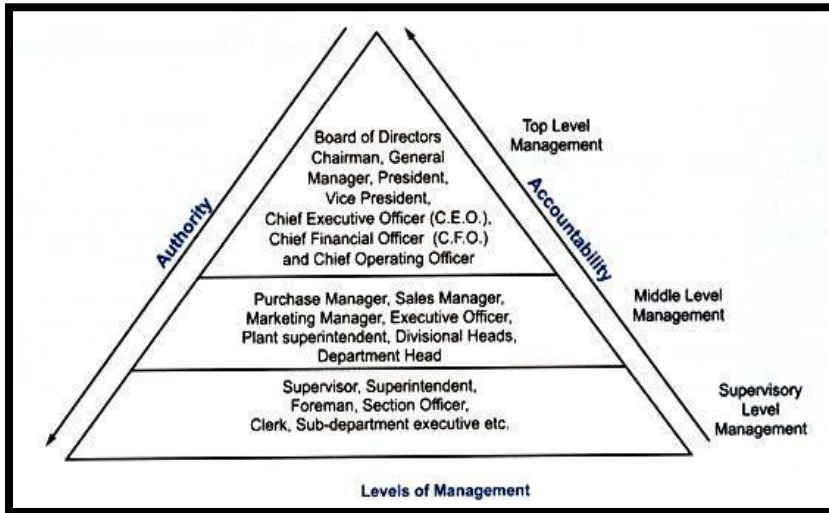
17

- Figure below shows the involvement % of the different levels of management for:
 - (Planning *vs.* controlling)
 - (conceptual *vs.* technical)



Summary (Levels of Management)

18



Project Management

19

- **Project management**, is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.
- Project Management involves
 - Planning,
 - Organizing
 - Staffing
 - Directing; and
 - Controlling
- Project management major constraints are
 - Time
 - Cost
 - Performance of the end product

Project Management Main (Function) Activities

20

Planning

- ☑ Objectives
- ☑ Resources
- ☑ Work break-down schedule
- ☑ Organization

Scheduling

- ☑ Project activities
- ☑ Start & end times
- ☑ Network

Controlling

- ☑ Monitor, compare, revise, action

Project Manager

21

- A project manager is the person who has the overall responsibility for the successful
- **PLC**
 - ❑ Initiation,
 - ❑ Planning,
 - ❑ Design,
 - ❑ Execution,
 - ❑ Monitoring,
 - ❑ Controlling, and
 - ❑ Closure of a project.

Project Management Institute (PMI)

22

- Project Management Institute is the world's leading not-for-profit professional organization for Project Management.
- PMI provides services including the development of standards, research, education, publication, hosting conferences and training seminars, and providing accreditation in project management.



Project Management Institute	
Founded	1969
Type	Professional Organization
Focus	Project management
Location	Newton Square, Pennsylvania, United States
Area served	Worldwide
Method	Certification, Industry standards, Conferences, Publications
Members	341,900+
Employees	51–200 employees
Slogan	"Making project management indispensable for business results"
Website	www.pmi.org

Main Resources (3Ms)

23

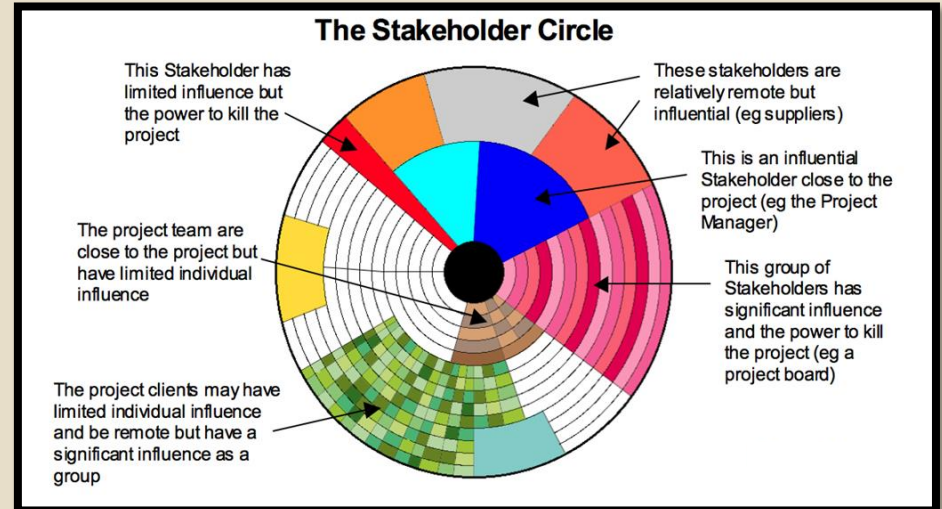
1. *Money*
2. *Materials & Machines*
3. *Man Power*



Project Stakeholders

24

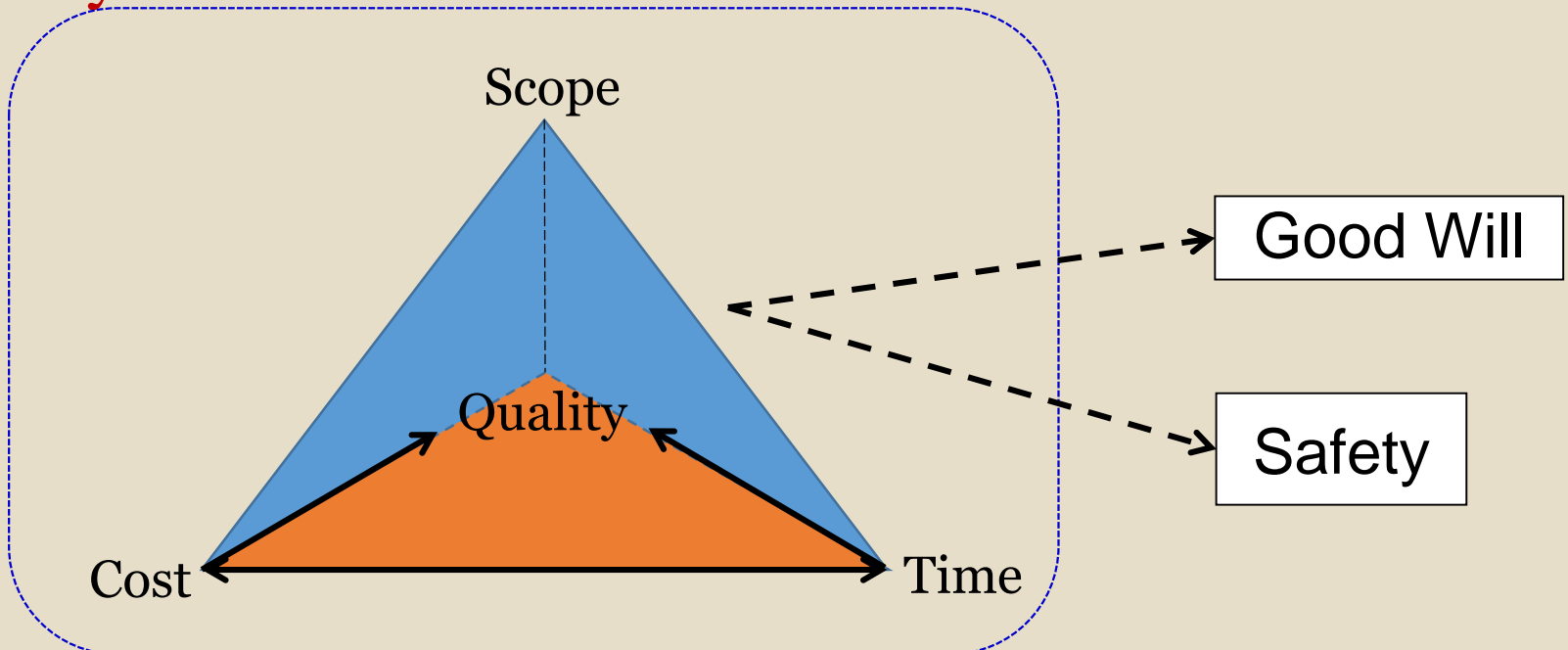
- Project sponsor
- Project owner
- Project manager
- Customer/user
- Functional managers
- Performing organization
- Project management team
- Internal and external contractors
- Suppliers and vendors
- Government agencies and media



Critical Success Factors for Different Project Objectives

25

- Scope
- Cost
- Time
- Quality



Assessing Success of a Project

26

- Here are the six factors for measuring the success of a project:
- **Schedule**
 - Within schedule?
- **Scope**
- **Budget**
 - This is often the most important factor for many projects. In the end, did you stick to the budget?
- **Team satisfaction**
 - Keeping the team happy means if I do need them to work a late night here and there, they won't do it begrudgingly.
- **Customer satisfaction**
- **Quality of work**
 - The quality of one project often affects another, If you deliver a strong product, your client will tell people about it, and that's where your next project should come from.

A Real Life Application

27

What is Construction Management?

A lot of work goes into constructing a building, but how is it all managed and facilitated?



Further Reading

28

Read more about the Project Management Institute (PMI) from:
www.pmi.org

Thank You

29

Questions Please

