1.040 Project Management
Spring 2009

1.040/1.401
Project Management
Spring 2009

Course Introduction

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Outline

➢ Introduction

▪ Course Information

▪ Lecture Outline

▪ T.A.

▪ Students; Background, Interests, & Expectations

Project Management

- Focus of Class – Construction Projects; Primarily Infrastructure Projects

Topics

- The Course is divided in three parts:
    - Part 1: Project Finance
    - Part 2: Project Evaluation
    - Part 3: Project Organization
- There will be a few Guest Lecturers

Term Project (1.401)

- Step 1: Preliminary Project Proposals

- Step 2: Project Details

- Step 3: Deliverables
  - Report
  - Presentation

Construction Phases & Class Topics

FEASIBILITY ANALYSIS

DESIGN

DEVELOP-MENT

CLOSEOUT

OPERATIONS

DIVESTMENT
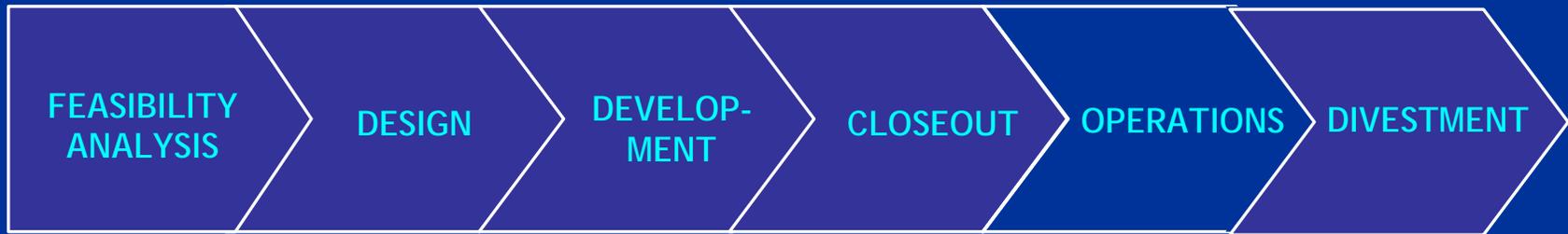
PROJECT MANAGEMENT

Construction Phases

- **Strategic Planning**, or conceptualization The need for a project is identified, so that specific Objectives are achieved Alternative projects (including the do-nothing option) are examined

- **System Design** The approach for addressing the organization's strategic concerns is established during systems design The requirements are translated into specific technical specifications

- **Detailed Design** is the phase in which the optimal systems design is translated into a detailed technical implementation scheme

- **Development** refers to the implementation of the detailed design

- **Operations and Lifecycle Support** represents the period during which the project yields benefits to the organization

- **Divestment** The initial design again determines the potential for proper divestment in the context of the sociopolitical and natural environment

Feasibility Studies and Preliminaries

- Understanding project finance and evaluation
  - Helps understand economic challenges faced by owner and contractor
- Risk management
- Deciding on fundamentals of contract
  - Delivery systems (organizational method)
  - Contract type (how pay?)
  - Award method (how decide who hired?)

Construction Phases

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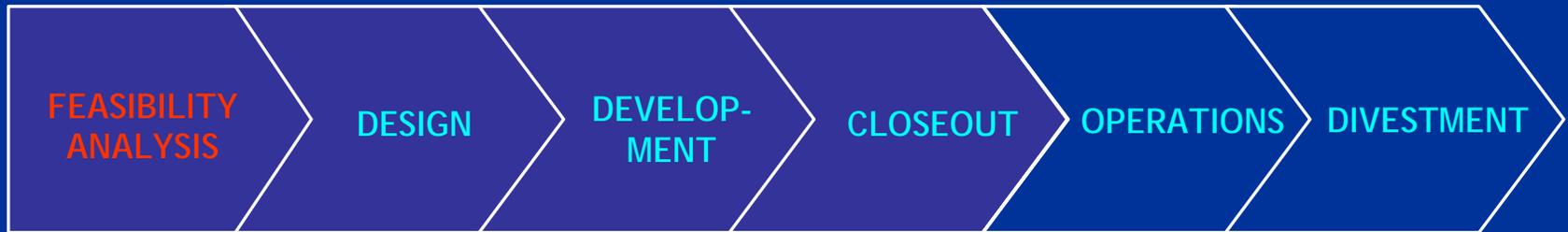
PROJECT MANAGEMENT

Design Phase

- Estimation
  - Successive estimates produced
- Planning & Scheduling
  - WBS – Web Based Scheduling
  - Deterministic & probabilistic scheduling
  - Resource planning
  - Simulation

Project Dynamics

- As-planned vs. as-built (e.g., errors and changes)

- Significance of feedbacks - Counter-intuitive effects of policies (e.g., overtime)

Construction Phases

FEASIBILITY ANALYSIS → DESIGN → DEVELOP-MENT → CLOSEOUT → OPERATIONS → DIVESTMENT
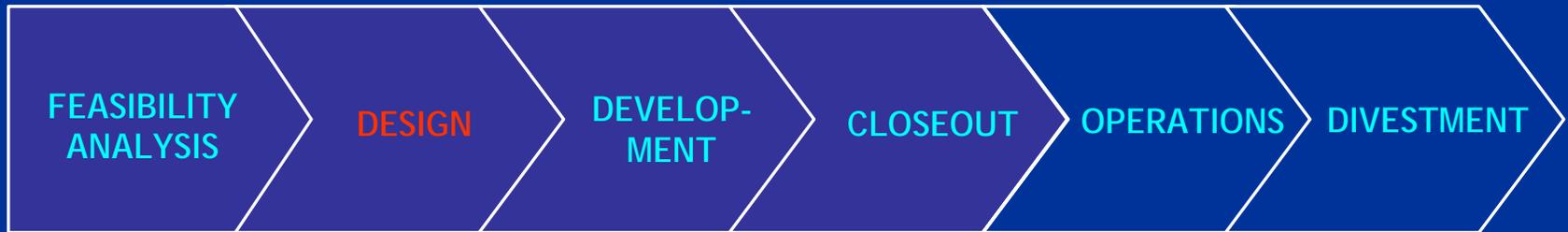
PROJECT MANAGEMENT

Project Management

1. The phases of
- Development
- Close Out

Resource Scheduling

Simulation

Basics of Project Monitoring and Control

Changes and Claims

Earned Value Analysis

Quality Reviews and Audits

Project Management

1. The phases of
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Resource Scheduling

Simulation

Basics of Project Monitoring and Control

Changes and Claims

Earned Value Analysis

Quality Reviews and Audits

Resource Scheduling

- How to allocate resources ($, time, etc.) to execute a given task efficiently

-Trade offs between conflicting/competing resources

Tools: graphical analyses, programming (linear, integer, heuristic, etc.)

Project Management

1. The phases of
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Resource Scheduling

Simulation

Basics of Project Monitoring and Control

Changes and Claims

Earned Value Analysis

Quality Reviews and Audits

Simulation

- Involves mathematical description/representation of the management process

- Helps identify optimal schedules and decisions

- Helps to quickly determine impact of alternative schedules

-Tools: algorithms implemented on computers

Project Management

1. The phases of
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Resource Scheduling

Simulation

Project Monitoring and Control

Changes and Claims

Earned Value Analysis

Quality Reviews and Audits

Project Monitoring and Control

-How to track your project costs, schedule (time), and other resources

- Helps ascertain whether targets are being met

- Needed so that due changes can be made to schedule as and when necessary

Project Management

1. The phases of
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Resource Scheduling

Simulation

Basics of Project Monitoring and Control

Changes and Claims

Earned Value Analysis

Quality Reviews and Audits

Changes and Claims

-What are the causes of time delays, cost overruns, change orders?

- How can such problems be prevented or mitigated

- Conflict resolution

Project Management

1. The phases of
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Resource Scheduling

Simulation

Basics of Project Monitoring and Control

Changes and Claims

Earned Value Analysis

Quality Reviews and Audits

Earned Value Analysis

-is a snapshot in time (as the project is in progress)

- compares work plan vs. actual work progress

- is a standard method of   (a) measuring project progress at any given point in time,
                          (b) updating forecasts of completion date and final cost,

- Is an early warning system to detect deficient or endangered progress.

Project Management

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Basics of Project Monitoring and Control

Changes and Claims

Earned Value Analysis

Quality Reviews and Audits

Quality Reviews and Audits

-Quality Control (typically done by owner's inspectors at the end of major production phases.

- Quality Assurance (typically done by contractor throughout the production, incl. raw materials

- Audits and QA/QC Reviews (retrospective in nature)

Project Management

1. The phases of
  - Development
  - Close Out

2. Related Topics
  - Risk and Uncertainty, etc.