

ENGR 310

Lecture 21

11 April 2008



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Mountains & Minds

Announcements

- No office hours today.
- Assignment 7 due ahead of recitation next week.
- Journal check next week.
- Exam graded (hopefully) by next week.



Assignment 8: Design Fair

- May 1, 12:00 – 6:00 p.m., SUB Ballrooms
- Let me know if you need power, other.
- Poster and Model will be evaluated
- Team & individual presentations expected
- Some at table all the time
- Everyone there for one hour minimum



Assignment 9: Final Package

- Team binders
 - updated assignments under each tab
- Design Journals
 - final check
- Due 5:00 p.m., Monday, May 5
- Grading Sheet



Lifecycle Engineering

Design



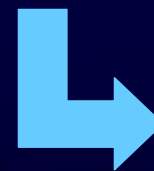
Fabrication
or
Construction



Distribution



Use
+
Service



Disposal

Design with the entire
lifecycle in mind.

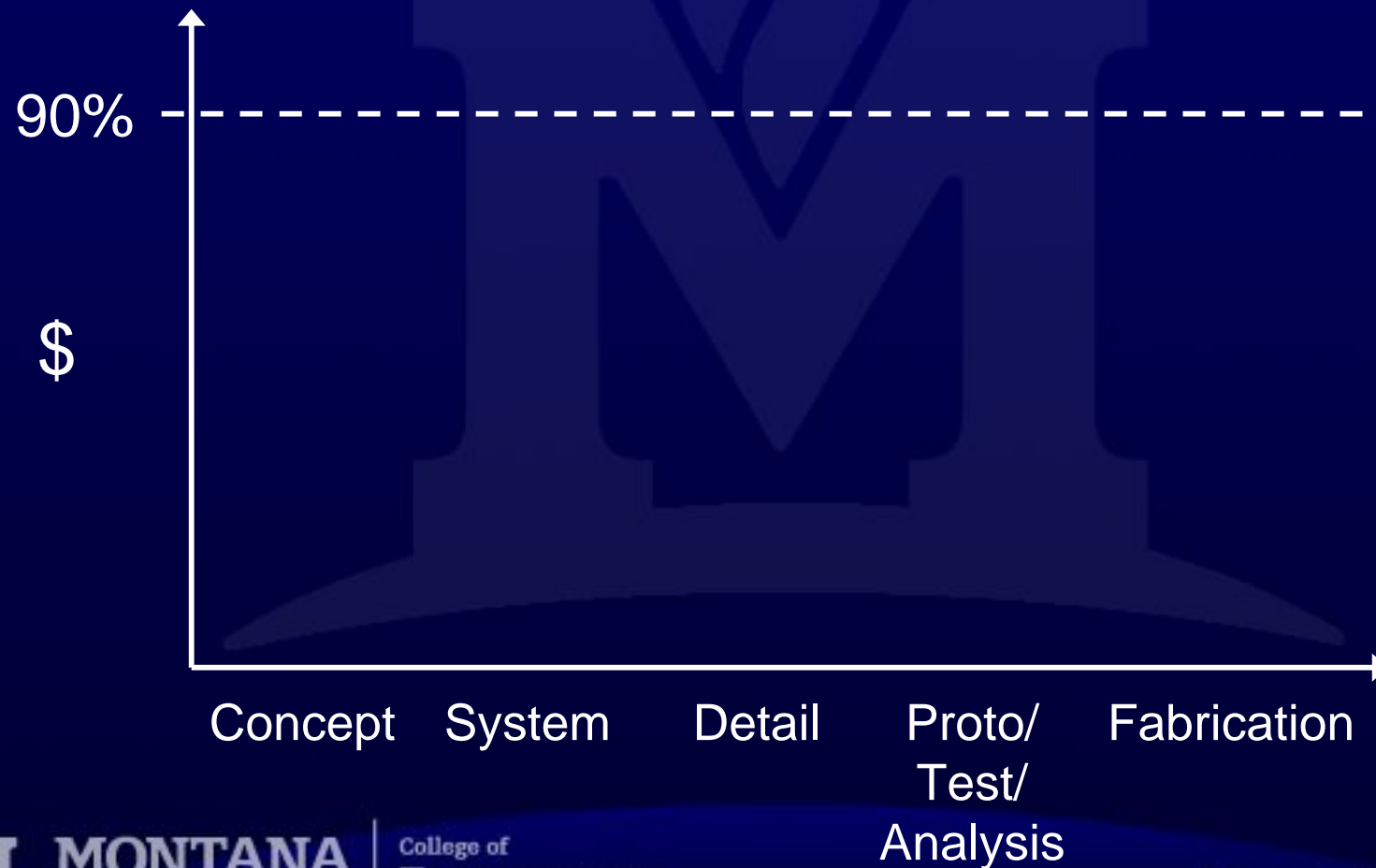


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Early decisions have biggest effect on lifecycle costs.



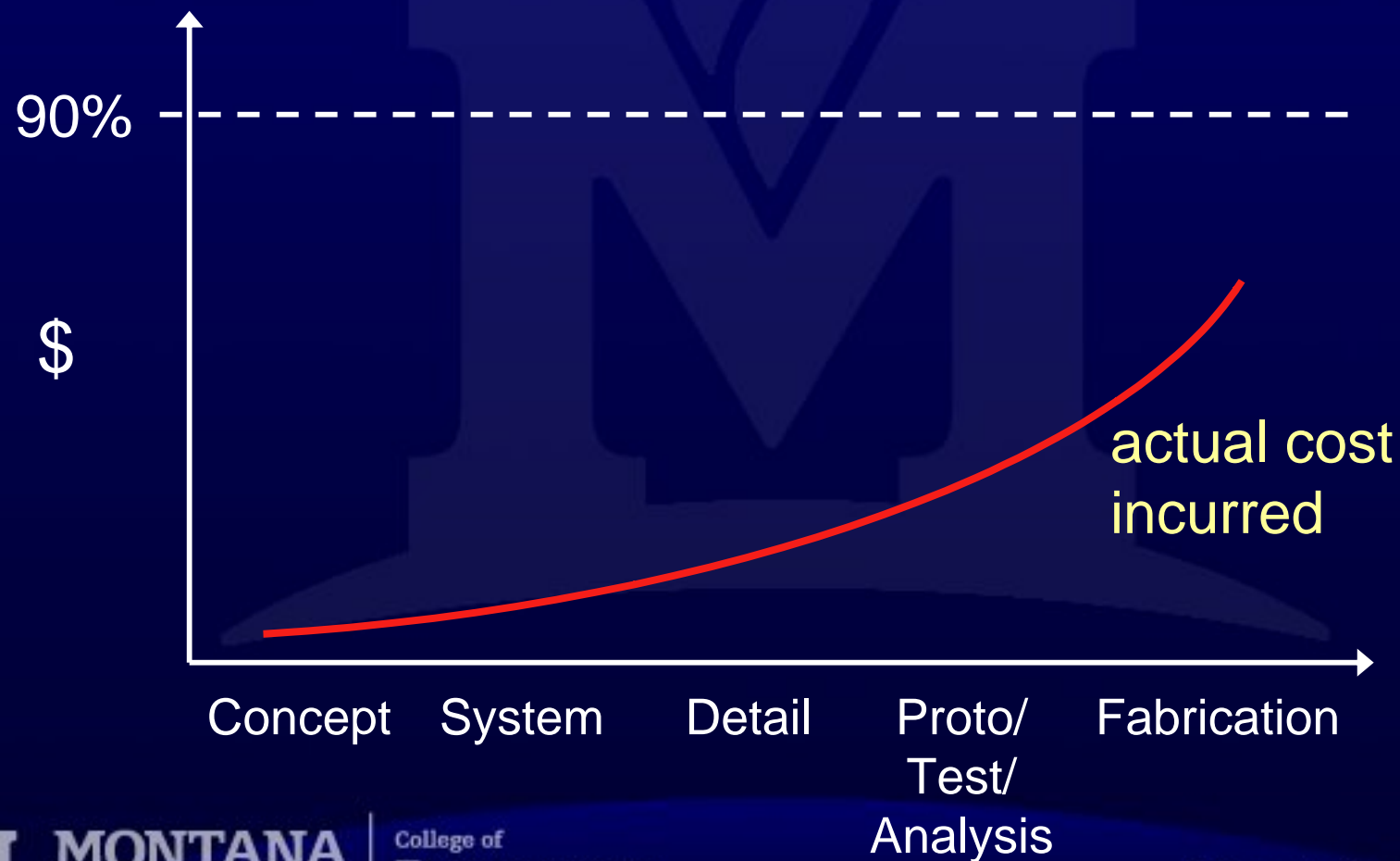
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Proto/
Test/
Analysis

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Early decisions have biggest effect on lifecycle costs.

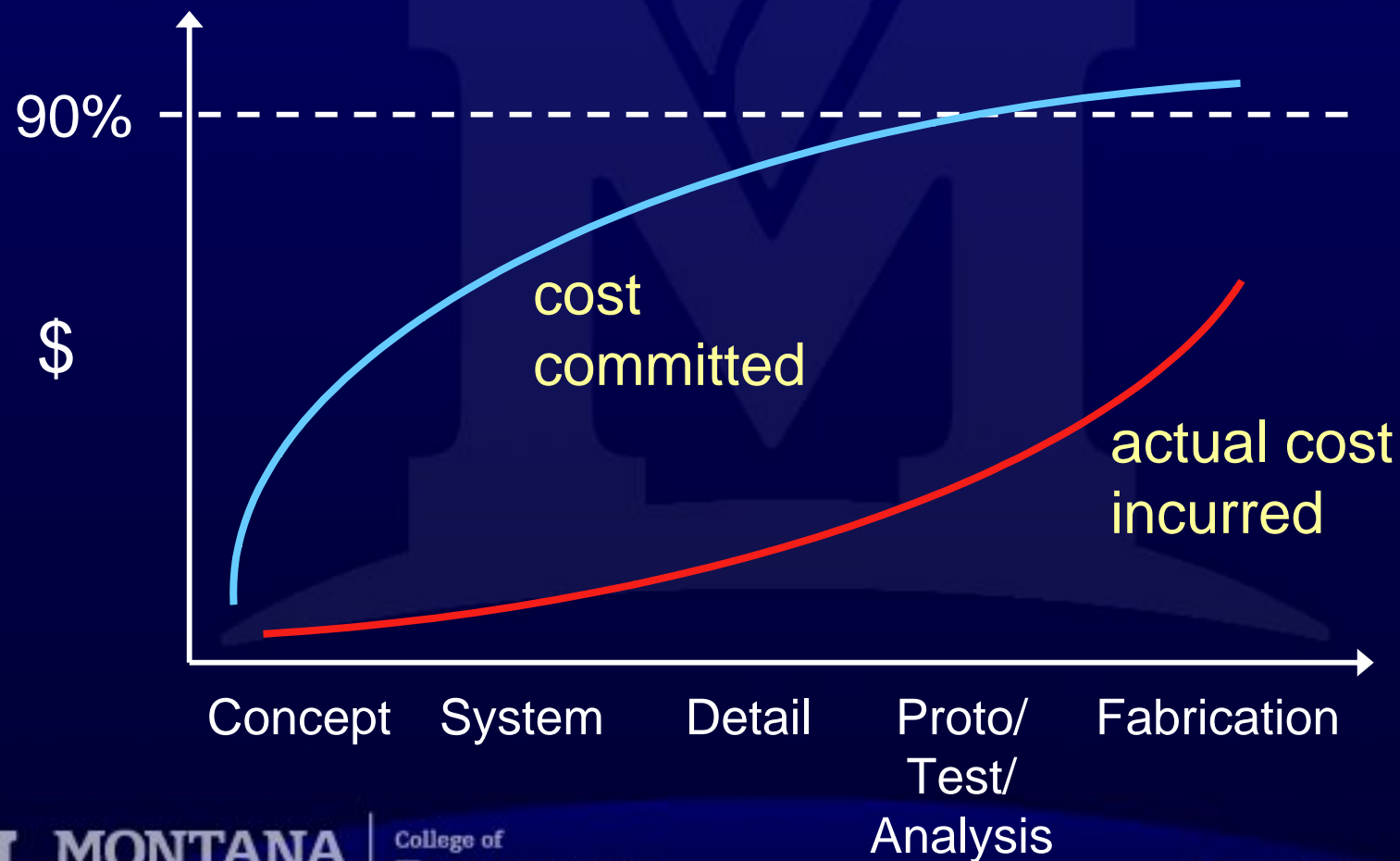


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Early decisions have biggest effect on lifecycle costs.



Modern engineering design practice

- Takes the full lifecycle into account.
- Current trends:
 - manufacturability / constructability
 - reliability / robustness
 - disposal / recyclability



Concurrent Engineering

Design Engineering



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Concurrent Engineering

Design Engineering

Manufacturing Engineering

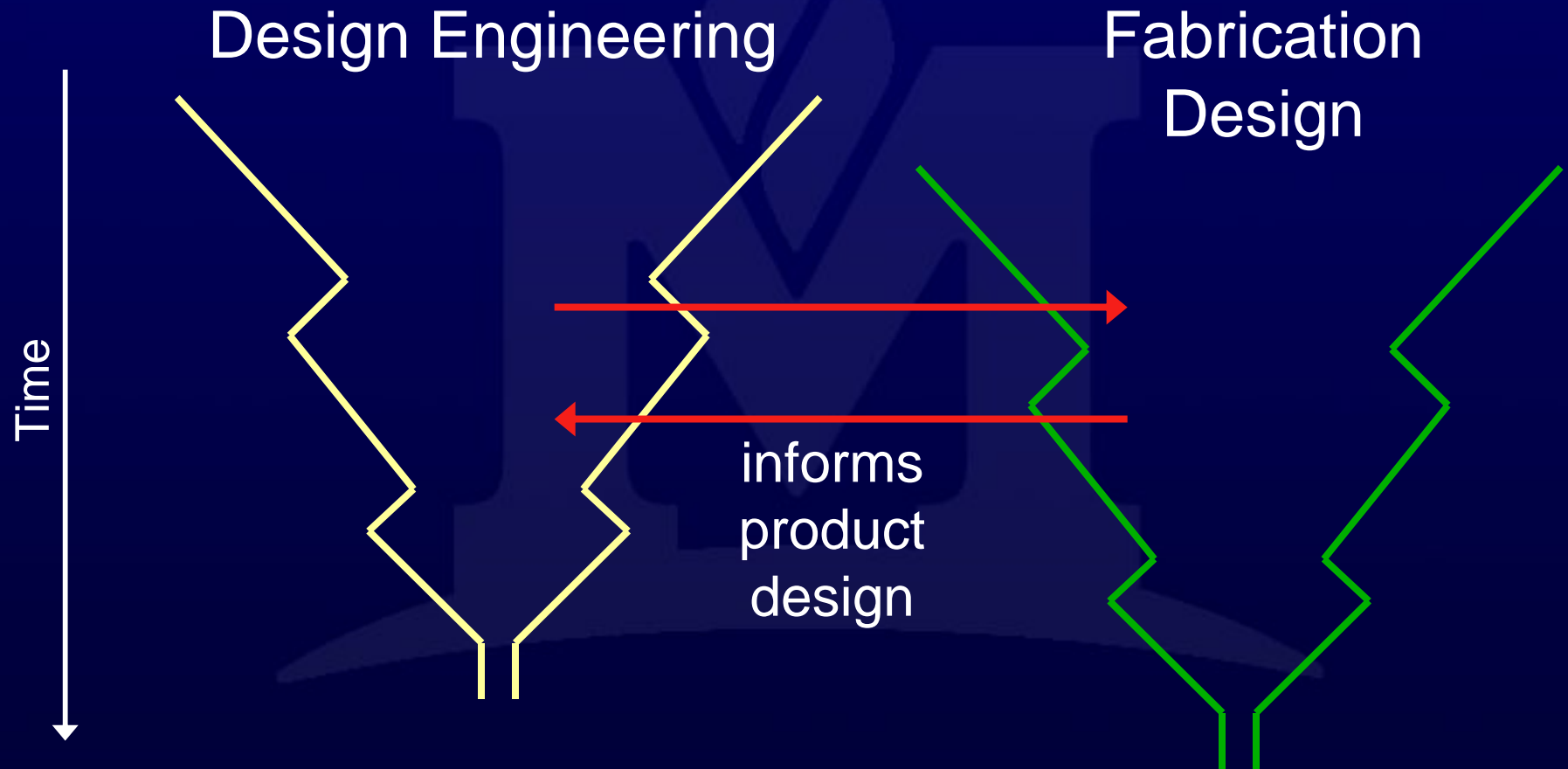


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Concurrent Engineering



Fabrication Design

- In Manufacturing
 - equipment specifications, layout, assembly sequence, material flow, etc.
- In Construction
 - construction methods, sequence, timing



Some Design Principles

- Use standard parts and sizes.
- Modularize the design.
- Minimize the number of parts.
- Minimize part variation.
- Maximize tolerances.
- Allow access



Robust Design

- Design so that the system is NOT sensitive to variations in:
 - manufacture
 - environment
 - use
 - etc.
- Taguchi methods



Design for Recyclability, Disassembly, Reuse

- Materials selection
- Fabrication techniques: allow disassembly?
- Packaging
 - marketing and aesthetics
 - product protection
 - storage
 - waste

