ENGR 310

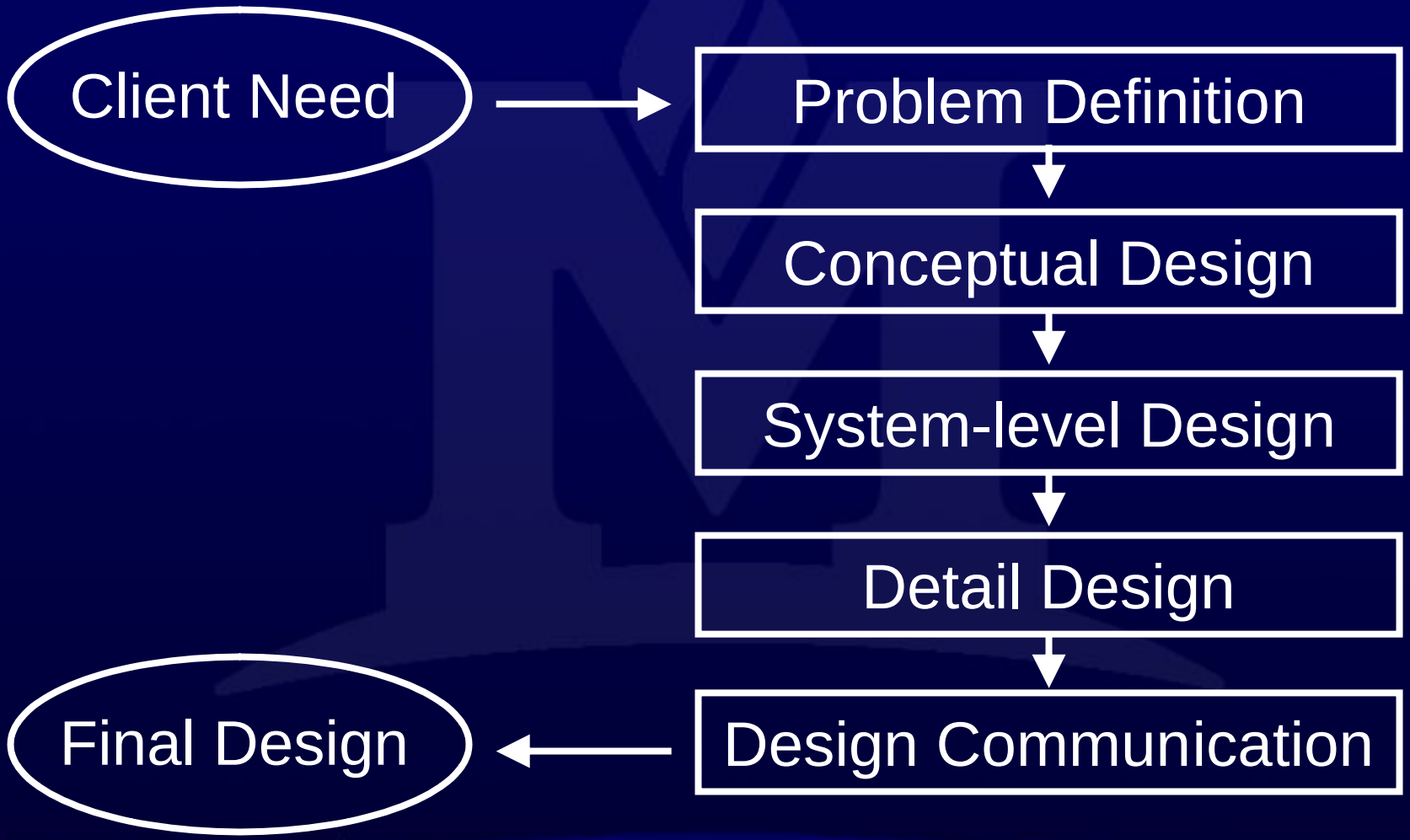
Lecture 14

4 Mar 2008

Announcements

- Journal Check this week
- Assignment 4 due this week
- There **is** class Friday.

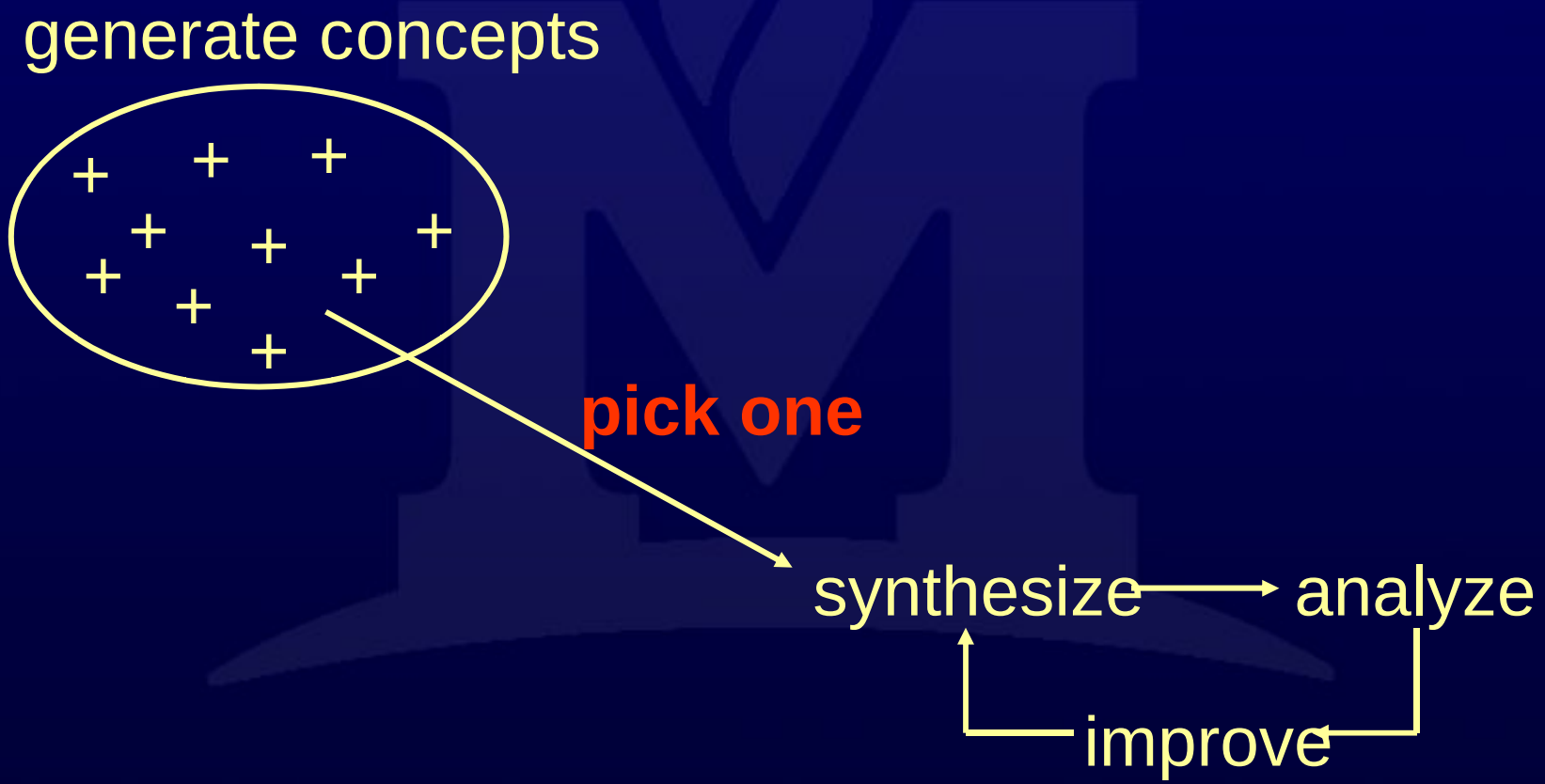
An Engineering Design Process



We have a bunch of ideas.

Now what?

A Typical Approach



Setting up a Meeting Example

A: My best time is 10:00. Can you make it?

B: No, I can't. How about 2:00?

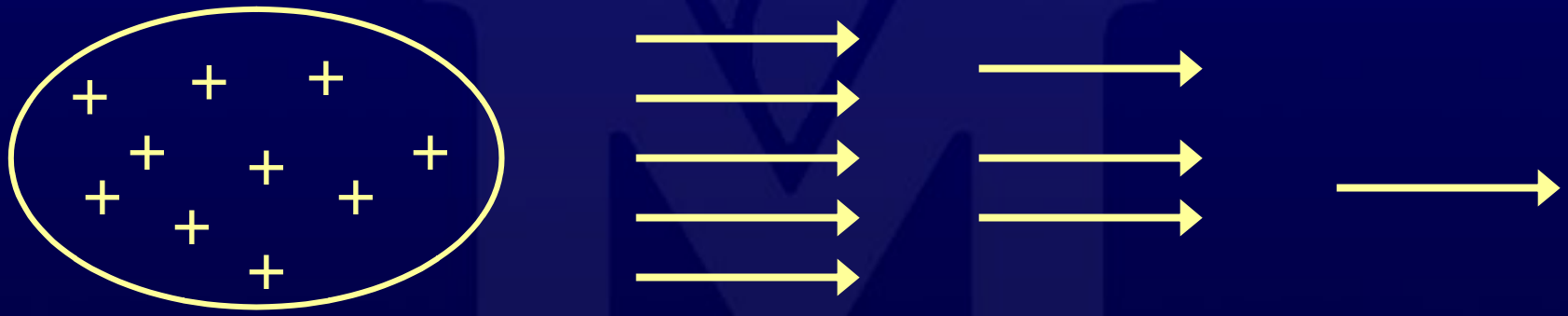
A: Uh, already booked. Can you meet at 3:00?

B: No, 3:00 is bad. 9:00?

?

An Alternative Approach

generate concepts



Look at sets of design ideas…

…and eliminate the worst.

(rather than pick the best)

A Set-Based Approach

- Now set up the meeting by communicating about sets.

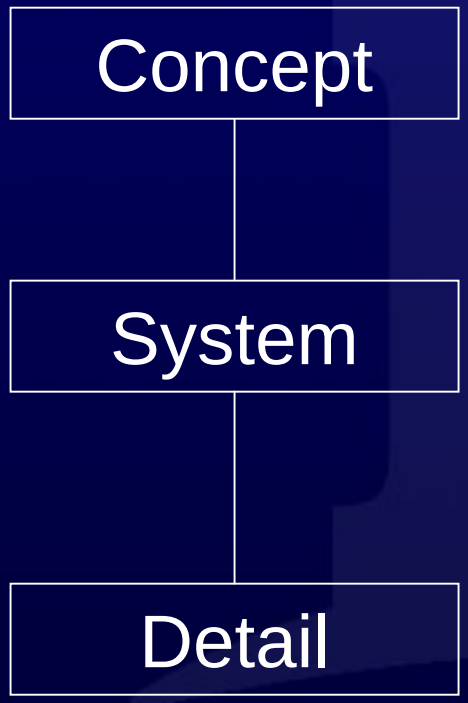
A: I can meet 10:00 - 1:00 or 3:00 - 5:00. Can you make any of these times?

B: Let's meet 12:00 - 1:00.

Design Convergence…

…isn’t usually smooth.

We also observe the following



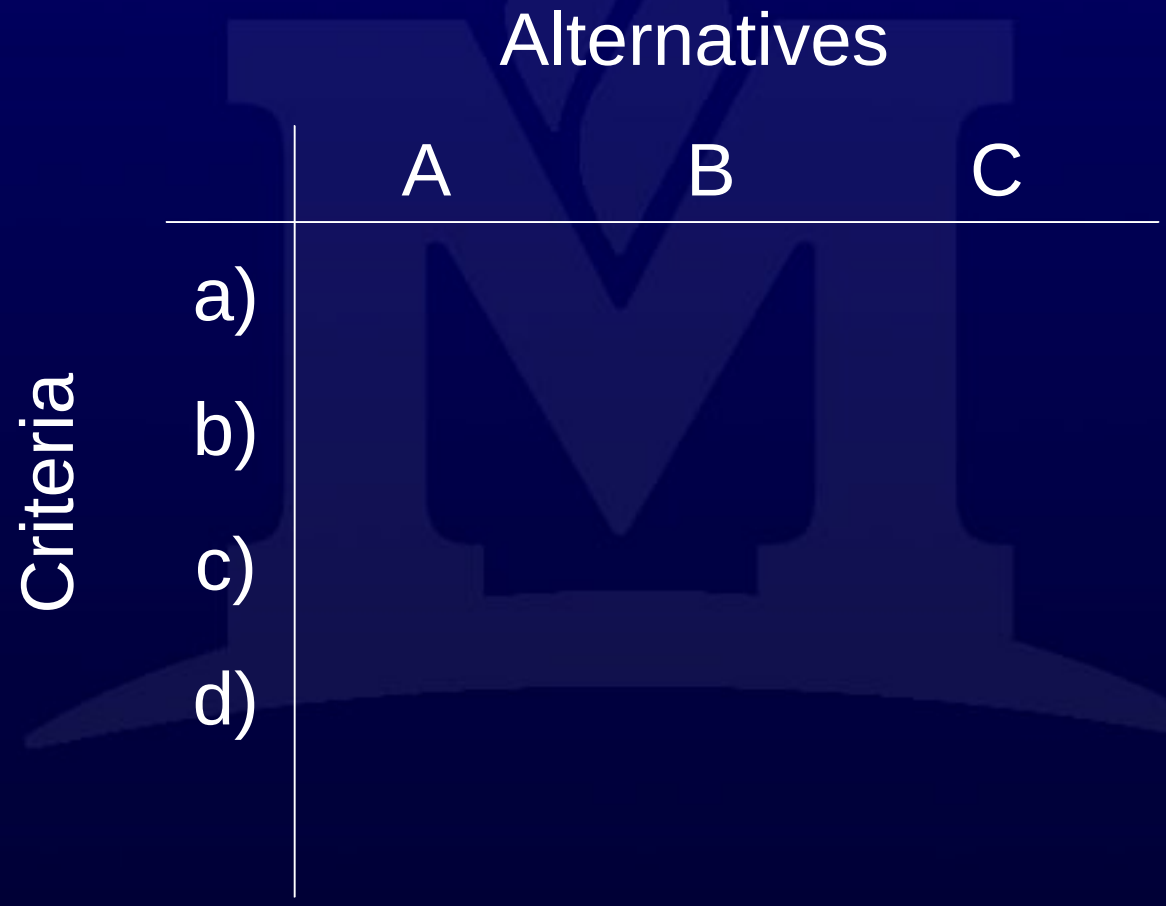
- **Identify Subsystems**
- **Configuration**
- **Interfaces**

We also explore ideas here!

Controlled Convergence

1. Identify a good set of viable alternatives.
   - constraints
2. Identify evaluation criteria.
   - objectives

Evaluation Matrix



Controlled Convergence, cont.

3. Choose a strong datum (or benchmark).
4. Rate the remaining alternatives
   - \+ better than the datum
   - \- worse than the datum
   - 0 same as datum, or don't know, or team disagreement
5. Eliminate alternatives if dominated by another

Example

Criteria	A (Datum)	B	C
a)		+	+
b)		-	-
c)		0	-
d)		+	0

Alternatives

Controlled Convergence, cont.

7. Develop remaining alternatives (e.g., system architecture)

   &

   Do more research / analysis
8. Incorporate combinations and new alternatives as they arise
9. Repeat

Variations

- Can make more robust by repeating evaluation using a different datum
  - look for consistency
- Can also use numerical scores instead of +/-/0 system
  - but only useful for rough rank ordering
  - avoiding using numerical scores to select an alternative!

Exercise

1. Get with your team.
2. Set up an evaluation matrix for concept design convergence.
3. Choose a datum.
4. Begin evaluation using +/0/- system.