Good HW Problems.

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Good HW Problems.

Work with the instructor to establish goals for the Design problems to address the goals.

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Use a mix of qualitative and quantitative problems as appropriate.

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Avoid re-using old problems

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Add problems that become part of the learning process Go beyond the in-class material

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Ask students to apply concepts learned to real-life problems and experiences.

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Ask students to apply concepts learned to real-life problems and experiences.

• Try to tailor examples to students interests

Design tests that emphasize what the students should have learned

Test skills other than recall Avoid questions that require the recall of trivial details

State questions clearly and precisely

"Bloom" taxonomy: Questions that Measure... Knowledge:

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Knowledge:

- Define
- Identify
- Match
- List

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- Define
- Identify
- Match
- List

Comprehension:

Knowledge:

- Define
- Identify
- Match
- List

Comprehension:

- Explain
- Summarize

Knowledge:

- Define
- Identify
- Match
- List

Comprehension:

- Explain
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Application:

Knowledge:

- Define
- Identify
- Match
- List

Comprehension:

- Explain
- Summarize

Application:

- Calculate
- Derive

Knowledge:

- Define
- Identify
- Match
- List

Comprehension:

- Explain
- Summarize

Application:

- Calculate
- Derive

Analysis:

Knowledge:

- Define
- Identify
- Match
- List

Comprehension:

- Explain
- Summarize

Application:

- Calculate
- Derive

Analysis:

- Analyze
- Illustrate

Knowledge:

- Define
- Identify
- Match
- List

Comprehension:

- Explain
- Summarize

Application:

- Calculate
- Derive

Analysis:

- Analyze
- Illustrate

Evaluation:

Knowledge:

- Define
- Identify
- Match
- List

Comprehension:

- Explain
- Summarize

Application:

- Calculate
- Derive

Analysis:

- Analyze
- Illustrate

Evaluation:

• Compare/contrast

Knowledge:

- Define
- Identify
- Match
- List

Comprehension:

- Explain
- Summarize

Application:

- Calculate
- Derive

Analysis:

- Analyze
- Illustrate

Evaluation:

• Compare/contrast

Synthesis:

Knowledge:

- Define
- Identify
- Match
- List

Comprehension:

- Explain
- Summarize

Application:

- Calculate
- Derive

Analysis:

- Analyze
- Illustrate

Evaluation:

• Compare/contrast

Synthesis:

- Design
- Construct

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Grading HW/exams.

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Grading HW/exams.

Work with the reader to define grading metrics.

Image: A matrix

Work with the reader to define grading metrics.

Provide opportunities for students to make-up lost points can add tremendous value to the learning process

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A rubric is a set of components accompanied by definitions of performance levels for each, e.g.

Component	Level			
	Developing	Competent	Exemplary	
Provides Supporting Evidence.			Provides strong	
			supporting	
	Gives some	Supports main	evidence for main	
	support, but	assertions but	and subsidiary	
	sources not	no subsidiary	points with	
	authoritive.	points.	multiple	
			authoritative	
			sources.	

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Saves times and improves consistency in grading.

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Even in development.

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How many numbers in $\{0, \ldots, N-1\}$ have inverses mod N, if $N = p^2$?

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How many numbers in $\{0, ..., N - 1\}$ have inverses mod N, if $N = p^2$? Rubric:

- 32

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How many numbers in $\{0, ..., N - 1\}$ have inverses mod N, if $N = p^2$? Rubric:

• Knows *p* is prime? (My bad.)

- 32

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- Properly count relatively prime numbers.

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 - Therefore: $p^2 p$...or p(p-1)

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 - ► Almost: (p 1)²)...

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