



Mechanical Engineering Dept Doctoral Qualifying Exams Q&A

April 22, 2004

The Purpose of the Quals

From the MechE Graduate Guide:

“The purpose of the qualifying examinations is to determine whether the applicant possesses the attributes of a doctoral candidate: **mastery of the mechanical engineering disciplines** and ingenuity and skill in **identifying and solving unfamiliar problems.**” (emphasis added)



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2

The Rules

- Must take the exams no later than three regular terms after admission to the PhD program
- Exams offered every May and January
- Student chooses three out of ten subject areas
- Also presents research as a thesis exam
- If the student fails the first time, he/she may be offered a second chance



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3

The GAME Survey

- March 2004 via anonymous web form
- 40 of ~100 students submitted survey
- Took quals in at least one of these periods
 - May 2002
 - January 2003
 - May 2003
 - January 2004



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4

Passing Rate

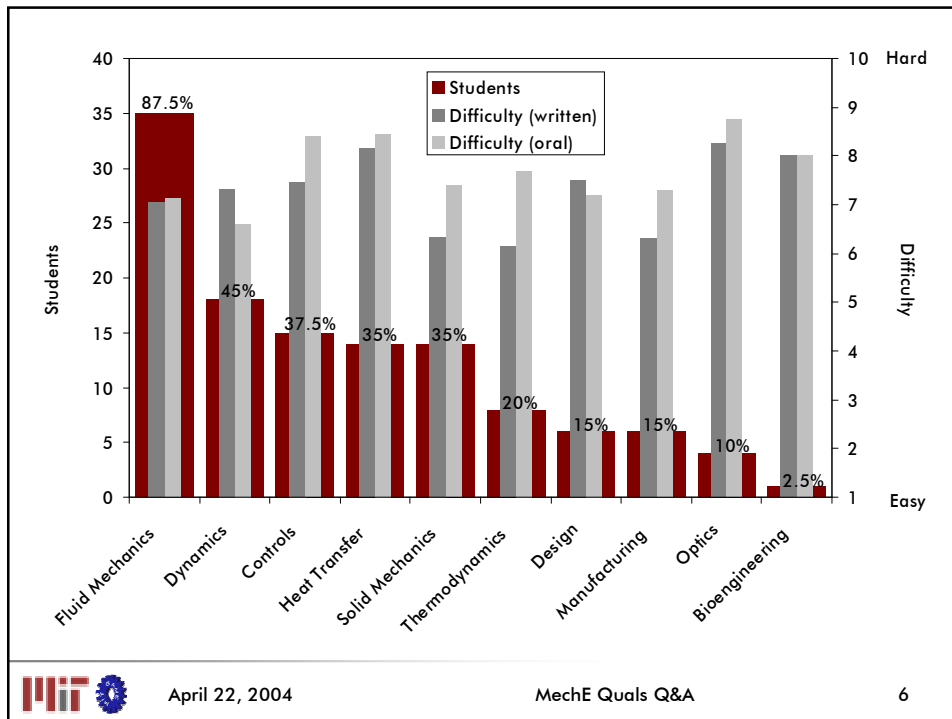
- 26 (65%) of responders passed the **first time**
- No data for **final** passing rate
- Survey question:
 “What do you think is the **final** passing rate?”
 Average guess: 64.8 %



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5



April 22, 2004

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6

Preparing for the Exams

- “How far in advance did you start studying?”
3.4 months
- “How many hours per week did you study?”
25.3 hours, often ramping up near test time
- “Did you have a study group?”
YES: 72% pass, 50% fail, 67.5% overall



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7

Preparing for the Exams

- Study materials, ranked by relevance
 - 1) Old exams
 - 2) Class materials
 - 3) Class textbooks
- Did the department provide you with enough study resources?
21 (55.3%) of students said NO
- Students want:
 - 1) Old tests with solutions; all prior exams online
 - 2) More information on the breadth of each exam



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8

Preparing for the Exams

- Fluid Mechanics: 2.25, 2.21*
- Heat Transfer: 2.52, 2.55, 2.51, 2.56
- Thermodynamics: 2.42, 2.006
- Controls: 2.14, 2.151*
- Dynamics: 2.032
- Solid Mechanics: 2.083, 2.305, 2.071
- Manufacturing: 2.810
- Design: 2.75
- Optics: 2.710
- Bioengineering: BEH.410J, BEH.430J

* Considered irrelevant by test takers



April 22, 2004

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9

Comments

“Why do you think MechE students complain about the quals?”

- Overall scores are not published
- Passers don't know how well they performed
- Just passing down the tradition from past students
- Only get two chances, then must leave
- Too many exams in a few days
- Failure percentage is too high
- Thesis exam is not objective
- So many rumors



April 22, 2004

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10

Comments

“Why do you think MechE students complain about the quals?”

- The quals are used to weed people out
- We’re not used to harsh treatment
- Passing criteria not well defined
- Results meeting is very secretive
- Students who fail blame the system instead of recognizing that they are not prepared
- I failed the first time, but I had no one to blame but myself.



April 22, 2004

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11

Recommendations for Faculty

- Provide students with exam content and format at least one semester in advance
- Publish all past exams on web so all students have access to same study material
- Provide actual statistics on passing rate
- Provide better support for students that fail the first time
- **Provide more opportunities for your own students to make oral presentations and receive critical feedback**



April 22, 2004

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12

Recommendations for Students

- Start studying in advance, but don't burnout
- Learn how your body reacts to stress
- Form study groups
- Practice your oral communication skills
- Take time to build confidence in the subjects and your research area
- Seek feedback if you fail the first time and figure out how to improve

