Harvey Mudd College
Mathematics Program
CBMS Forum 2014

Rachel Levy
Twitter: @mathcirque
Grandma got STEM
ggstem.wordpress.com

My awesome teaching collaborators!
<table>
<thead>
<tr>
<th>Speaker bashes previous work</th>
<th>Repeated use of “um…”</th>
<th>Speaker sucks up to host professor</th>
<th>Host Professor falls asleep</th>
<th>Speaker wastes 5 minutes explaining outline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laptop malfunction</td>
<td>Work ties in to Cancer/HIV or War on Terror</td>
<td>“…et al.”</td>
<td>You’re the only one in your lab that bothered to show up</td>
<td>Blatant typo</td>
</tr>
<tr>
<td>Entire slide filled with equations</td>
<td>“The data clearly shows…”</td>
<td>FREE Speaker runs out of time</td>
<td>Use of Powerpoint template with blue background</td>
<td>References Advisor (past or present)</td>
</tr>
<tr>
<td>There’s a Grad Student wearing same clothes as yesterday</td>
<td>Bitter Post-doc asks question</td>
<td>“That’s an interesting question”</td>
<td>“Beyond the scope of this work”</td>
<td>Master’s student bobs head fighting sleep</td>
</tr>
<tr>
<td>Speaker forgets to thank collaborators</td>
<td>Cell phone goes off</td>
<td>You’ve no idea what’s going on</td>
<td>“Future work will…”</td>
<td>Results conveniently show improvement</td>
</tr>
</tbody>
</table>

Jorge Cham © 2007

www.phdcomics.com
Quick Facts

Claremont, CA
About 50 years old
800 students, gender balanced
99% residential
STEM majors, HSA concentration
Impact on society
Core curriculum for ~2 years
Quick Facts

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- Biology
- Chemistry
- CS
- Engineering
- HSA
- Mathematics
- Physics
What would you like to discuss?

(I’ll ask again in a few slides.)
BIG GOAL

Preparation for graduate school (eventually 60%), industry, other mathy or non-mathy work
HMC Mathematics
year-long Senior Capstones

Thesis

individual project
faculty mentor
semester class
external presentation
poster
thesis doc
70 papers since 2000
HMC Mathematics
year-long Senior Capstones

**Thesis**
- individual project
- faculty mentor
- semester class
- external presentation
- poster
- thesis doc
- 70 papers since 2000

**Clinic**
- 4 student team
- faculty mentor
- industry liaison
- professional development
- site visits, presentations
- poster
- clinic report
HMC Math Core

Frosh year

Fall

Proof
Calc
Prob/Stat
HMC Math Core

Frosh year

Fall  | Spring
---   | ---
Proof| Lin Al I
Calc |   |
Prob/Stat| DE I
# HMC Math Core

## Frosh year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proof</td>
<td>Prob/Stat</td>
</tr>
<tr>
<td>Calc</td>
<td>DE I</td>
</tr>
</tbody>
</table>

## Sophomore year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi Var</td>
<td>LinAI DE II</td>
</tr>
</tbody>
</table>

- Prob/Stat
- DE I
- LinAl DE II
HMC Math Core

Frosh year
- Fall: Proof, Calc, Prob/Stat
- Spring: Lin Al I, DE I, Python (CS)

 Sophomore year
- Fall: Multi Var
- Spring: Lin Al DE II

WRIT I (all)
HMC Math Core

Frosh year

Fall

Proof

Calc

Prob/

Stat

Spring

Lin Al

I

DE

I

Sophomore year

Fall

Multi

Var

LinAl

DE II

Spring

DE

III

LinAl

III

Core

Major

Python (CS)

WRIT I (all)
HMC Math Core

Frosh year

Fall
- Proof
- Prob/Stat
- Python (CS)
- WRIT I (all)

Spring
- Calc
- DE I

Sophomore year

Fall
- Lin Al I
- Multi Var
- Lin Al DE II

Spring
- DE I
- DE III
- Lin Al III

Core

Major

Discrete
Algebra
Analysis
PDE
Speaking
Computing
Electives
HMC Successes

• Publications
• Departmental award (MAA)
• Teaching awards (Alder, Haimo)
  • Writing awards
• National leadership roles
  • Research funding
• Pure & applied math competitions
  • Outreach
• Postdoctoral program
HMC Challenges

• Growth of the college
• Varied preparation on entry
• Very condensed half-courses
• Sharing math culture and practice
  • Preparation for all majors
  • Computational preparation
• Interdepartmental communication
  • Curriculum modernization
Personal projects

- Undergraduate Research
- Incoming SIAM VP for Education
- Flipped Classroom Study
- Mathematical Modeling in K-16
- Elementary School Teacher Preparation
- Visual Communication
- Postdoctoral Mentoring Program
- SIAM Undergraduate Research Online
  - Grandma got STEM
What would you like to discuss?
Thank You!