

# Characteristics of Successful Programs In College Calculus

## Advisory Board Meeting



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PowerPoint available at  
[www.macalester.edu/~bressoud/talks](http://www.macalester.edu/~bressoud/talks)

## People:

Marilyn Carlson, ASU, co-PI, coordinator for survey

Chris Rasmussen, SDSU, co-PI, coordinator for case studies

Phil Sadler & Gerhard Sonnert, Harvard, Statistical Analysis

Peter Ewell, NCHEMS, consultant and external evaluator

Michael Pearson, MAA, co-PI, program administrator

Olga Dixon, MAA, program coordinator

## Case Study Team Leaders:

Chris Rasmussen, SDSU, co-PI, coordinator for case studies, doctoral universities

Eric Hsu, SFSU, master's universities

Sean Larsen, PSU, bachelor's colleges

Vilma Mesa, U Michigan, two-year colleges

## Phase I: Survey

Aug. 2009 – July 2010, preparation of instruments, recruitment of institutions

Aug. 2010 – Jan. 2011, administration of surveys

1. Institutional questionnaire, chair
2. Calculus coordinator questionnaire
3. Instructor pre-term survey
4. Student 2<sup>nd</sup> to 3<sup>rd</sup> week survey
5. Student 2<sup>nd</sup> to 3<sup>rd</sup> last week survey
6. Instructor post-term survey
7. Collection of final exams and grades

Feb. 2011 – forever, analysis of data

## Phase II: Case Studies

Feb. 2011 – Aug. 2012, recruitment of teams,  
preparation of protocols, recruitment of institutions

Sept. – Nov. 2012, case study visits

Each of the four teams will make a 2–3 day visit  
to at least two and not more than four institutions

Dec. 2012 – forever, analysis of data, publication of  
results

July 2014, end of grant

## Agenda:

9:00–9:30 Overview of process to date

9:30–10:30 Sadler and Sonnert on statistical model

10:45–11:15 Carlson and Tallman on exam analysis

11:15–11:45 Rasmussen and Ellis on “switchers”

11:45–12:30 discussion of next steps in analysis of  
survey data

Lunch and afternoon (until 4:00) on preparation for  
case studies, led by Chris Rasmussen

## Sampling:

207 two-year colleges, 40 (19%) participated

134 undergraduate colleges, 41 (31%) participated

60 master's universities, 21 (35%) participated

120 doctoral universities, 66 (55%) participated

521 institutions were asked to participate

211 (40%) agreed to do so

187 (36%) had an instructor who answered at least  
one survey

168 (32%) had students who answered at least one  
survey

The 211 institutions had 1170 instructors teaching mainstream Calculus I in Fall 2010.

660 instructors (56%) answered the first survey

628 instructors (54%) had at least some students answer the first student survey

500 instructors (43%) answered both surveys

The 500 instructors who answered both surveys represented 26,257 students in 659 classes, an average of just under 40 students per class.

We have the final grades for all of these students as reported by instructors:

A: 22%

B: 28%

C: 23%

D,F, or W: 27%

11,528 students started first student survey  
10,421 completed it

6,182 students started second student survey  
5,347 completed it

3,463 students had 1<sup>st</sup> and 2<sup>nd</sup> surveys that we were  
able to pair

10,831 students reported their high school courses  
6,587 of them (61%) took a calculus class in high  
school

4,532 (69% of those who took calculus in high school,  
42% of all students) took an AP Calculus course

3,677 (81% of those who took an AP Calculus course,  
34% of all students) took an AP Calculus exam

2,211 (60% of those who took the exam, 20% of all  
students) earned a 3 or higher on at least one AP  
Calculus exam

979 students (9.0%) earned a 4 or higher on the AB Calculus exam.

389 students (3.6%) earned a 3 or higher on the BC Calculus exam.

1239 (11.4%) did at least one of these

94 students (0.9%) earned a 5 on the BC Calculus exam.

183 students (1.7%) took AB Calculus one year, BC Calculus the following year, and then took Calculus I when they got to college. Extrapolates to over 5,000 such students in Fall Calculus I each year.