

FOSTERING OPPORTUNITIES FOR TOMORROW'S ENGINEERS (FORTE)



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Project Goals:

- (A) Improve retention rate and graduation rate of students in Engineering and Computer Science.
 - Increase 1-year retention rates from ~58% to 80%.
 - Increase overall graduation rate of new freshmen from ~31% to 58%.
 - Increase overall graduation rate of new transfer students from ~46% to 70%
- (B) Increase enrollment, retention, and graduation of female, and under-represented minority students.
- (C) Foster Partnerships with local high schools
- (D) Contribute research to the effectiveness of specific strategies for improving retention and graduation rates.

Project Components:

- (A) Summer Bridge Program
 - Morning Focus on Math Improvement
 - Afternoon Focus on Engineering/CS
- (B) Peer Mentoring / Study Groups
- (C) Living-Learning Community
- (D) Student Recruitment
- (E) Faculty Mentoring
- (F) Evaluation

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Bridge Program – Participation and Progress:

Purpose: Improve the math placement of incoming freshmen students, and generate excitement for engineering and computer science studies.

YEAR	PARTICIPANTS	# IMPROVED MATH PLACEMENT	PERCENTAGE IMPROVED
2009	37	25	68%
2010	47	39	83%

Success rate for math course improvement (which should improve retention through reduced time-to-graduation) has been seen.

Changes made between 2009 and 2010:

- Use of more hands-on instruction
- Evening tutoring made available
- Additional scholarship money for afternoon program

Living-Learning Community – Participation:

Purpose: Provide a nurturing on-campus environment for freshmen students in engineering and computer science.

Sample activities:

- Guest Speakers
- Robotics/Media Production program with Discovery World Museum
- Dedicated, on-site study groups
- Common courses with some students

ACADEMIC YEAR	PARTICIPANTS	2 nd -YEAR RETENTION
2009-10	41	78%
2010-11	42	NA

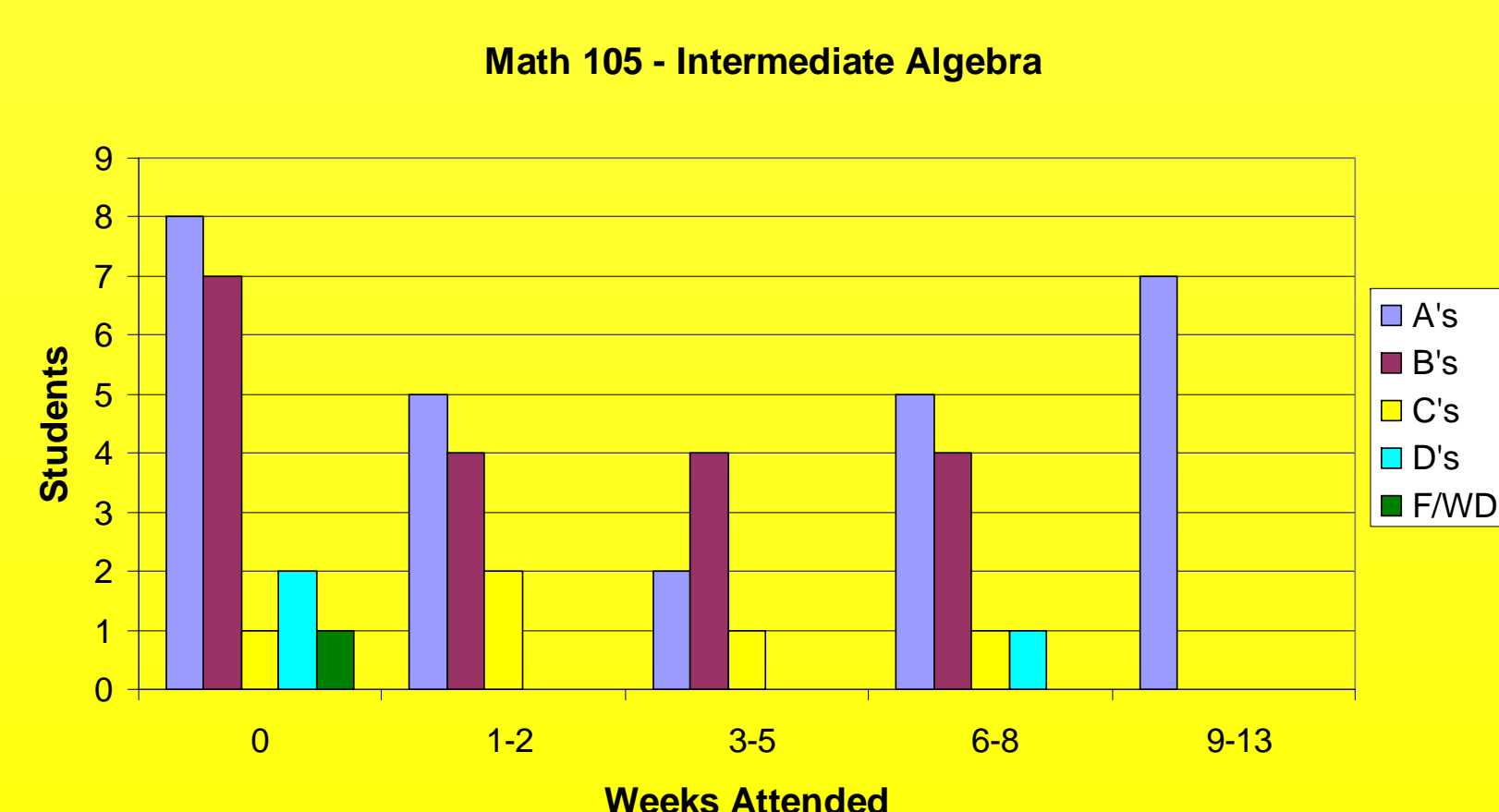
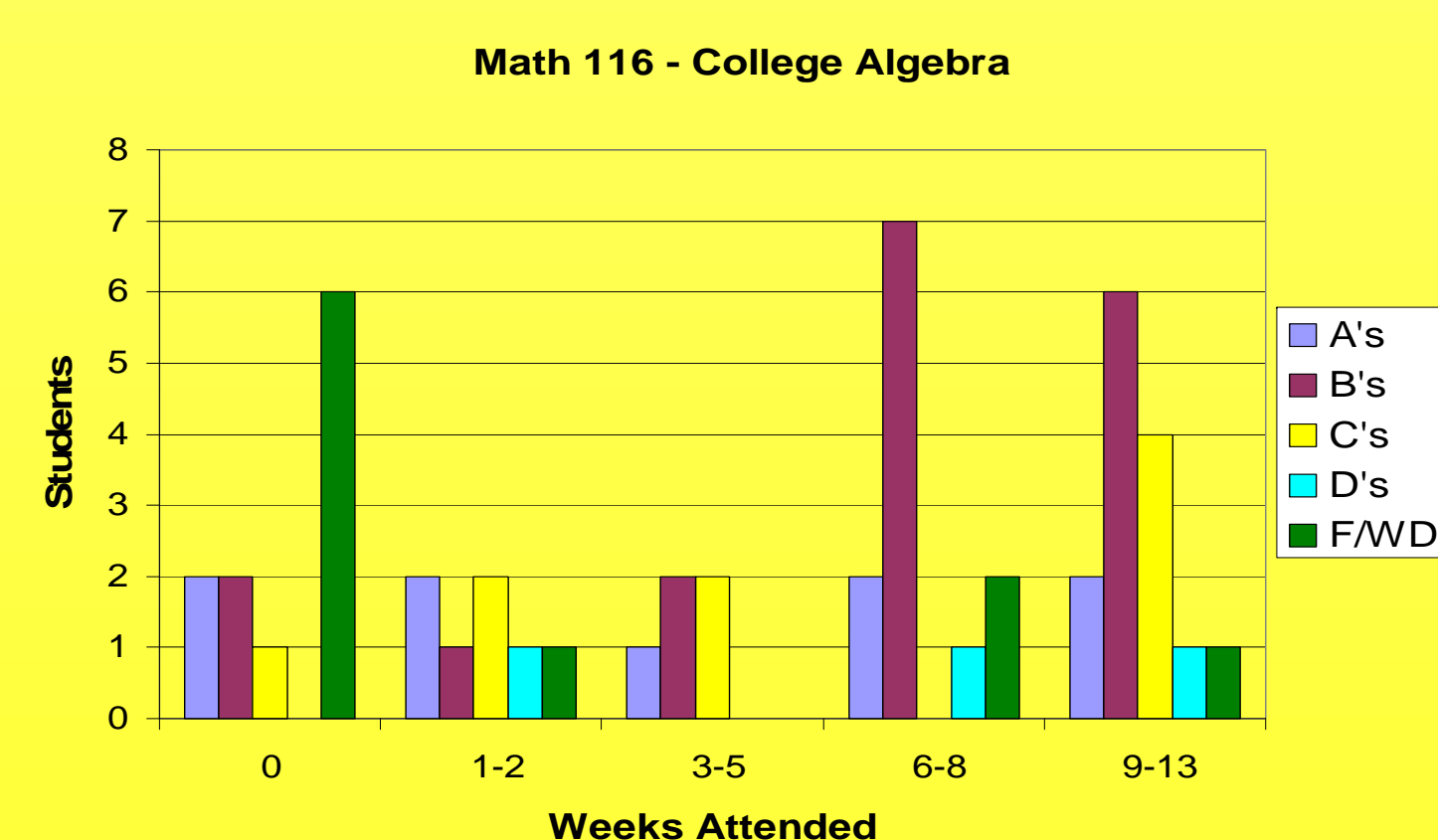
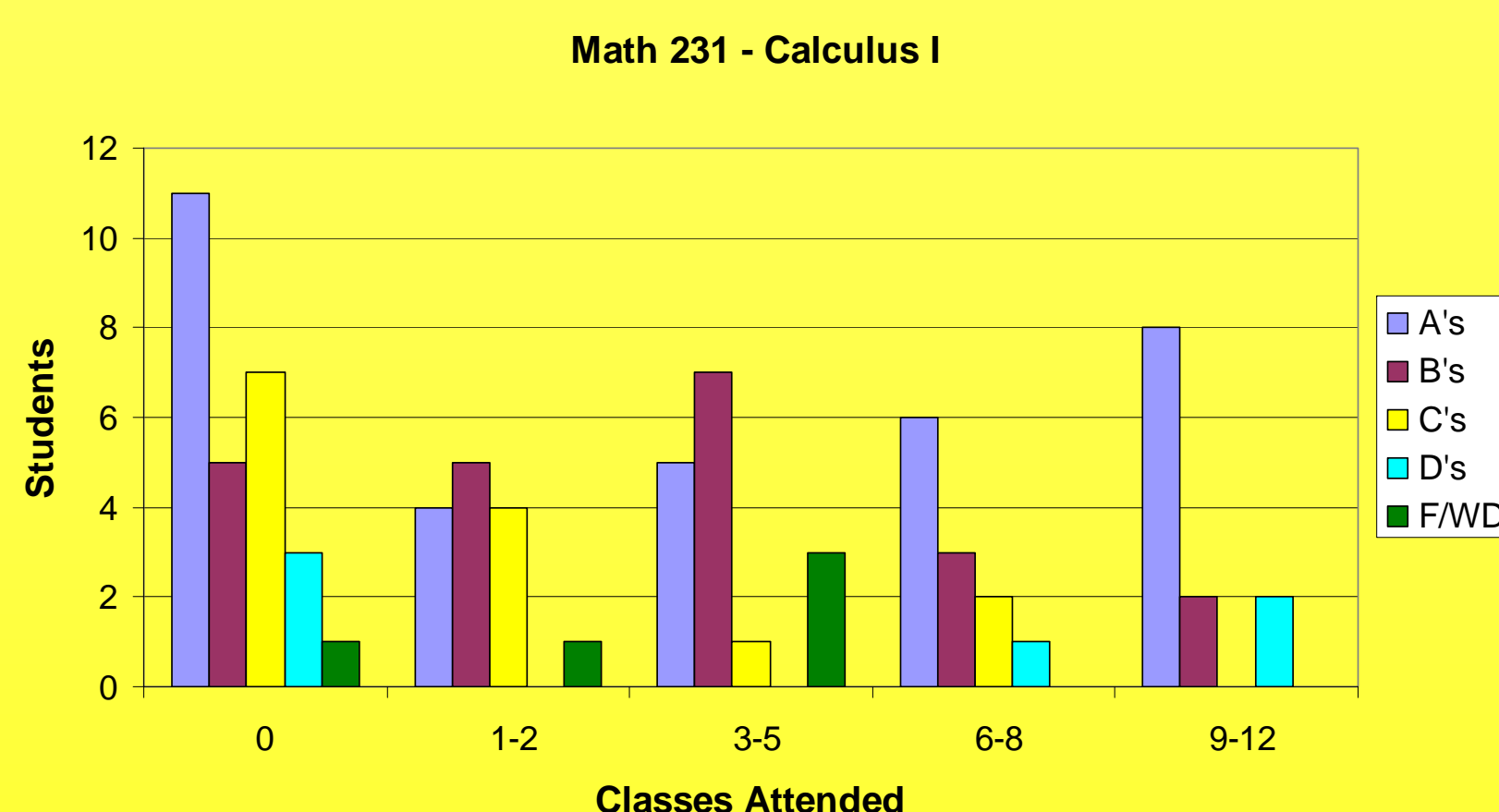
Study Groups – Participation and Progress:

Purpose: Provide additional math instructional support through small, undergraduate-led, study groups.

Study group size is 6-12 students, with groups formed around particular math courses. An undergraduate student facilitates the group, introducing problems to be solved and guiding the students in their solution techniques.

ACADEMIC YEAR	2008-09	2009-10	2010-11
PARTICIPANTS	16	133	147 (177)
INCOMING FRESHMEN	263	218	203

Impact of Study Groups – Fall 2009:



Increased study group participation indicates an improvement in course grades. **This suggests study groups are valuable.**

Some students do not need study groups, but many benefit from them.

Increased participation is desirable.

Study Group Participation Evolution:

2008-09: Study groups were set up based on math courses, but were completely optional for students. Participation was very low.

2009-10: All incoming freshmen were assigned to a study group before the Fall 2009 semester. Participation was optional, but the formality of the program was increased. Study group attendance was ~30%. In the Spring 2010 semester, students were again assigned to groups but attendance fell to ~15%.

2010-11: To ease scheduling and further increase the formal nature of the program, incoming freshmen were encouraged by advisors to register for a section of an officially offered course. Grades were assigned based upon study group participation. Most students in the course participated in 65% or more of the weekly sessions in the Fall 2010 semester.

Next Challenge: Math After the Bridge Program

In the Fall 2009 semester, only 15 (of 25) students who improved their math placement in the 2009 Bridge program subsequently further advanced in their math sequence by receiving a C or better in their math course. In addition, 3 students passed one of two classes (either Math 116 (College Algebra) or Math 117 (Trigonometry)) at the level before Math 231 (Calculus I). However, 7 of students who improved their math placement (and 3 who did not) failed to advance their math sequence.

Again in the Fall 2010 semester, only 18 students who improved their math placement in the 2010 Bridge program advanced through the math sequence, with 2 more passing either 116 or 117 (but not both).

There is a need to find strategies to continue to support the students who participated in the bridge program, possibly beyond the study group model.