



# STARS in Introductory Math for Engineering Applications

WASHINGTON STATE  
 UNIVERSITY

*World Class. Face to Face.*

## **Washington STate Academic RedShirt (STARS) Program at WSU**

- Graduation retention rate of incoming non-Pell Grant eligible students at WSU & UW is 42%.
- Graduation retention rate of incoming Pell Grant eligible students at WSU & UW is 28%.
- Program targets economically & educationally disadvantaged students.
- All participants have a Pell Grant and come from Washington state high schools with greater than 30% participation in free or reduced price lunch.

## STARS Advantage

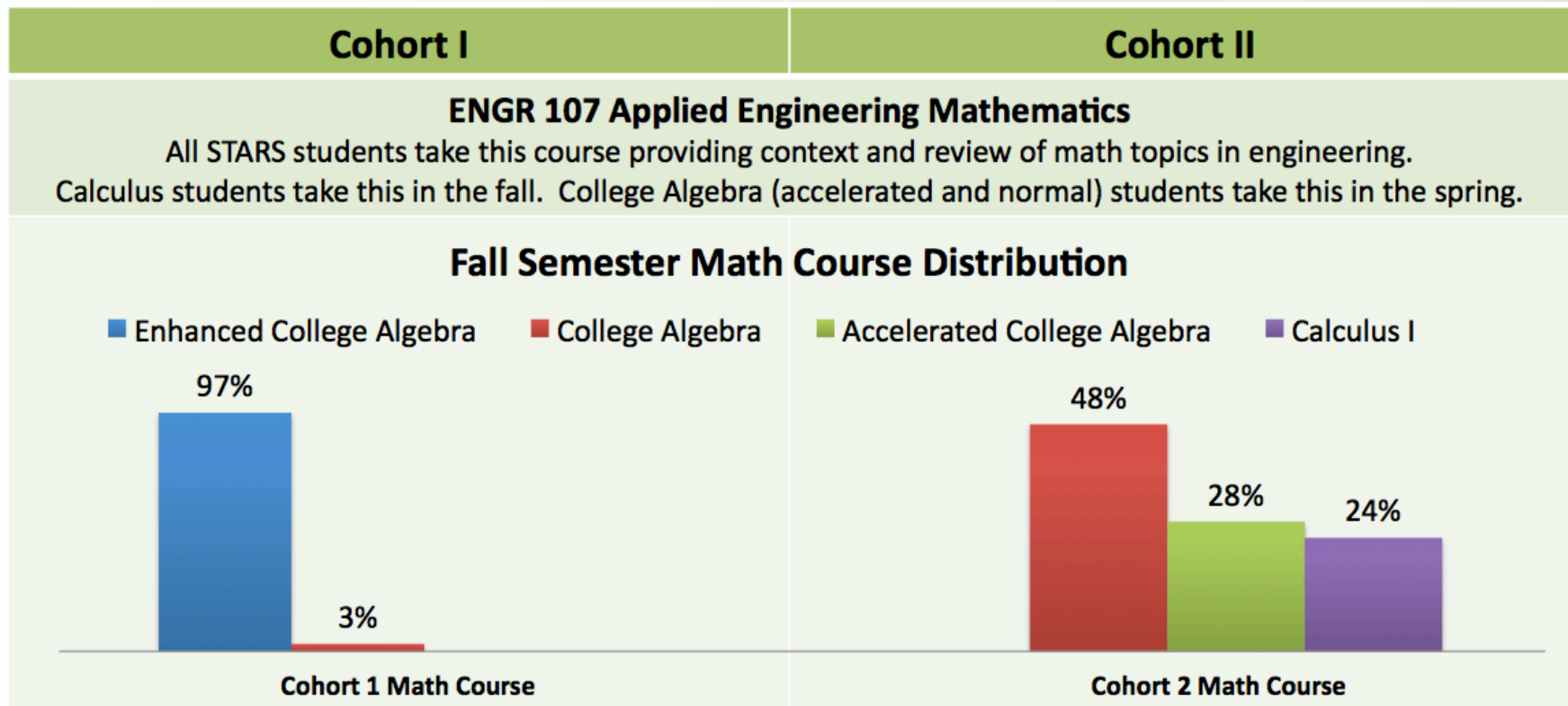
- Specialized Curriculum
- Small Group Math Study Sessions
- First-Year Coaching on the Study Skills & Habits to Succeed in an Engineering Curriculum
- Comprehensive and Individualized Academic Advising
- A Supportive Community of Peers, Faculty, & Staff
- Access to Tutoring & Peer Mentoring
- Scholarship Support

# STARS Program

- Hosted mandatory math review sessions specific to students' math classes. Many students attributed math success directly to these sessions.
- Met each student individually 3 times over course of semester to address progress and problems experienced.
- Participated in tour of Schweitzer Engineering Laboratories in Pullman.

Fall 2014		Spring 2015	
Course	Credits	Course	Credits
ENGR 101 Engineering Study Skills	2	ENGR 107 Engineering Math	3
MATH 106 College Algebra	3	ENGR 120 Engineering Innovations	2
BIOL 102 General Biology	4	MATH 108 Trigonometry	2
ENGL 101 English Composition	3	CHEM 101 Intro to Chemistry	4
ANTH 203 People of the World	3	HIST 105 Root of Contemporary Issues	3
Total	15	Total	14

# STARS Math Profile



# ENGR 107 Engineering Mathematics for STARS

- Taken concurrently with Trigonometry or Calculus I for most STARS students
- Contextualizes math providing introduction and motivation for future math and engineering classes
- Provides an opportunity to review and practice foundational mathematical concepts critical to success in Calculus
- Work engineering problem solving skills through homework formatting and problem review sessions

## **ENGR 107 Engineering Mathematics at WSU**

- Taken historically as an elective and offered during summers
- Counts for WSU quantitative requirement
- Non-STARS students have taken it as a means to improve math placement or as a review before starting Calculus sequence
- Non-STARS representation in class has been very low

# ENGR 107 Engineering Mathematics

## Qualitative Results

- “The real-world application made the class really connect to what I will do as an engineer. The support of Jeremy, the interesting concepts, and the easily digestible teaching methods used helped me succeed in this class.”
- “The labs helped me learn the most in this class because they provided physical applications of calculus with an engineering bent.”



## **ENGR 107 Engineering Mathematics Quantitative Results**

- Cohort I – 22 of 33 students took class; 16 (48%) remain in engineering after 4 semesters
- Cohort II – 24 of 29 students took class; 20 (69%) remain in engineering after 2 semesters
- Cohort II – 71% pass rate vs 68% general population in Calculus I
- Cohort II – 73% pass rate vs 56% general population in College Algebra