

# HOW MUCH HIGH SCHOOL MATHS DO STUDENTS NEED TO SUCCEED AT UNIVERSITY PHYSICS?

Andrew D. MacKinnon, Judith M. Pollard

Presenting Author: A.D. MacKinnon ([andrew.mackinnon@adelaide.edu.au](mailto:andrew.mackinnon@adelaide.edu.au))  
Department of Physics, University of Adelaide, Adelaide SA 5005, Australia

**KEYWORDS:** university physics, mathematics, high school maths preparation

## BACKGROUND

Most first-year calculus-based Physics courses offered at Australian Universities have prerequisites which include Year 12 Physics and typically two Mathematics subjects. An increasing number of students are attempting these Physics courses without the full mathematics pre-requisite.

## AIMS

To determine if attempting a calculus-based Physics course without having the full mathematical prerequisites impacts on a student's performance within that course, progression and success in later Physics courses.

## METHOD

At the University of Adelaide the ideal mathematical pre-requisites for Physics-IA (a calculus-based course) are the Year 12 SACE subjects: Mathematical Studies and Specialist Mathematics. However an increasing number of students are attempting this course without Specialist Mathematics. In 2014, 25% of the school-leaving students enrolled in Physics-IA had only completed Mathematical Studies and not Specialist Mathematics. This corresponds with a period over the last several years where the number of students completing Year 12 SACE Physics has remained constant but the numbers completing Mathematical Studies and Specialist Mathematics has declined.

The correlation between the reduction in the number of students completing the above Year 12 Maths subjects and reduction in the number of students who attempt Physics IA without the full mathematical pre-requisites has been examined using student enrolment from 2003 to 2014.

The difference in the success of students who attempt calculus-based Physics with and without the desired mathematical preparation has been analysed using enrolments from 2003 until 2014 in the following way:

- Success (grade obtained) in the first semester course Physics IA,
- Progression and success in Physics IB (semester 2 course).
- Progression and success in Second Year Physics courses.

## RESULTS AND CONCLUSIONS

Results and conclusion will be presented in detail at the conference.

Proceedings of the Australian Conference on Science and Mathematics Education, University of Sydney, Sept 29<sup>th</sup> to Sept 30<sup>th</sup>, 2014, page 56, ISBN Number 978-0-9871834-3-9.