Science, Technology, Engineering and Mathematics (STEM)

The University of Western Sydney Schools Engagement Program provides primary and high school students with opportunities to not only improve their academic performance, but also to expand their horizons.

UWS has made Science, Technology, Engineering and Mathematics (STEM) a priority area for Schools Engagement. The need to boost interest and capacity in STEM has been identified as a national priority crucial to Australia’s future. Universities and schools working together can do much to support these aims. By pooling knowledge and resources, looking at new ways of engaging students and developing exciting learning and development opportunities, UWS and the school sector are helping to produce the leading STEM practitioners and – most importantly – teachers of the future.

Lachlan Macquarie College (LMC)
LMC is a UWS partnership with the Western Sydney Region of the NSW Department of Education and Training. The College is a dynamic centre for excellence in mathematics and science, developing and providing high quality and innovative programs to improve student learning outcomes. Nine schools are currently involved, with plans to expand, and some programs are accessible to all Western Sydney public schools. Students take part in advanced academic enrichment activities such as Atomic Statistics and Astronomy online master classes, Gifted and Talented Mathematics Days, Experience Science@UWS Days, HSC lecture days and Tall Poppies seminars. UWS developed an online unit, Integrated Science, that brings together the different sciences and applies them to issues of global importance. This unit is available to both UWS undergraduate and senior high school students.

Science and Maths Exposed
This annual event for secondary school students is designed to enhance learning outcomes in science and mathematics and to highlight career options in those fields. Begun by Lachlan Macquarie College in 2011, it is open to students in both Western and South-Western Sydney. They listen to renowned keynote speakers including “Tall Poppies” and enjoy interactive experiences conducted by UWS academics and students, and representatives of a range of scientific firms and organisations.
ysf@UWS
This is a summer residential experiential science program for year 11 students, run in conjunction with the National Youth Science Forum and Rotary International. It includes workshops, tours and hands-on activities in chemistry, complementary medicine, science education, engineering, bio-imaging technology, global warming and nanotechnology. Students also complete leadership modules from the UWS Aspire program.

Math IT
Math IT is an annual fun and educational day for year 7 and 8 students who are talented in maths and/or ITC, but may not know the many real-world applications of these subjects. Participants’ feedback shows that students are absorbing the message “maths is behind pretty much everything when you look into it”.

Environmental Education programs
UWS has established partnerships with the Brewongle and Longneck Lagoon Environmental Education Centres to run exciting and challenging academic enrichment programs for stage 5 and stage 6 science students, including Cumberland Plain management and river ecology. Both programs involve students in gathering samples in the field (or from the river), testing and analysing them in the laboratory, and formulating conclusions.

Astronomy events
Every year 500-1000 school students participate in a range of astronomy evenings at the Penrith campus. There are family and school holiday programs on subjects such as ‘Life on Mars’, ‘Space Rocks’ and ‘Jewels of the Southern Sky’. There are also special programs for HSC astronomy, astronomy for teachers and astronomy for Indigenous students. Programs can be tailored to the needs of particular schools.

Heartbeat
Heartbeat is a multi-year program for young Indigenous students, focused on health, medicine and related sciences. It aims to raise students’ awareness of health issues, inspire some of them to careers in the relevant professions, and present the university as a place from them. Students join the program at an introductory on-campus event when they are in year 3 or year 4. There are new activities for the same students as they progress through primary school, so they can benefit from related learning experiences and become increasingly familiar with the university environment. Some parents also attend Heartbeat events.

Physics Academic Enrichment
UWS runs an annual physics half-day academic enrichment program. Year 10 to 12 students benefit from the knowledge of academics and professionals who are leaders in their fields.

NSW Brain Bee Challenge
UWS runs the state Brain Bee neuroscience competition (which originated at the University of Queensland), and hosts the state finals at the School of Medicine. The competition motivates young people to learn about the brain and think about careers in neuroscience. Every year around 120 bright science-minded students participate in keenly contested individual and team events. UWS offers scholarships to the top three students.

UniSteers
UniSteers is a team-based school competition with each school feeding, handling, training and caring for a steer over 100 days, then showing the steer and competing for prizes in various categories. As well as gaining valuable experience in the management of livestock, students develop their teamwork, communication and presentation skills.

Academic Speakers in Schools
UWS academics are available to speak in schools free-of-charge. Many prominent UWS science teachers and researchers are included on our Academic Speakers Register.

Other competitions
UWS organises and hosts regional rounds of other STEM competitions such as the Science and Engineering Challenge and the RACI titration competition.

Initiatives with other universities
UWS runs a ‘Siemens Science Experience’ every year and is one of the participant universities in the Honeywell Engineering Summer School.

Youth Eco-Summit (YES)
YES is an annual environmental education expo developed by the Western Sydney Region of the NSW Department of Education and Communities, UWS and the Sydney Olympic Park Authority, and from 2012, the NSW Curriculum and Learning Innovation Centre. Students of all ages visit Newington Armory to participate in a range of workshops, view displays and engage with representatives of government, industry and higher education. Regional schools take part via videoconference. The expo also incorporates a residential program where students built leadership and advocacy skills and showcase their schools’ environmental achievements.

Conferences and science events
UWS has hosted and partnered in a range of STEM conferences and events, including the Science Teachers’ Association of NSW (STANSW) conference, the NSW Department of Education and Training’s Environmental Education Conference, the South-Western Sydney’s Youth Environmental Network (YEN) conferences, the Victor Chang Awards (South-Western Sydney Region of the Department of Education and Communities) and the STANSW Young Scientists Awards.

For more information, please contact SchoolsEngagement@uws.edu.au or phone 9678 7423.