Emerging Sciences Victoria (ESV) - What is it?

- A real-time virtual classroom where JMSS teachers interact directly with participating students and teachers just as they would in the classroom, for 2 x 1-hour sessions each week;
- Specialised subjects in areas of emerging science designed to engage, inspire and encourage STEM-based studies and careers.

Who is it aimed at?

- Year 9 and 10 students in government schools across Victoria who are interested in and passionate about science;
- Students get the most benefit when their ESV subject is substituted for another subject/elective, and are released from other classes to attend, similar to instrumental music lesson attendance. ESV subjects have assessments and homework, and a report at the end of the semester.

What do we offer?

ESV offers 15-week courses each semester in:

- Frontiers of Physics - Astrophysics and Quantum Mechanics;
- Nanoscience and Nanotechnology;
- Biotechnology and Bioinformatics;
- Mathematical Logic 2 Magic.

Semester 2 2016

Starts 18th July 2016
Ends 11th Nov 2016
Attendance
2 x 1-hour classes per week, plus homework.
Course Fees
$100 per student per semester.

Partnership

John Monash Science School (JMSS), the Victorian Department of Education and Training (DET) and Monash University.

The partnership between JMSS and Monash University is unique in education in Victoria, and has been responsible for the creation of an exciting contemporary curriculum in science which has brought the cutting edge of scientific research into the modern secondary classroom. ESV brings significant aspects of this innovative curriculum to all Victorian Year 10 students who are passionate about science.

Note: Physics A and Physics B are 2 sets of classes of the same content, so students will register for either Physics A or Physics B.

Each course is an independent unit of study. Courses may be studied in any order, and there are no follow-on courses.

As the student numbers are capped for each course, schools are advised to complete the registration process as soon as possible online, or contact us at enquiries@emsci.vic.edu.au.

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www.emsci.vic.edu.au
What do participating students and teachers need?

- 2 hours per week for face-to-face classes, with up to an hour of homework;
- Notebook / laptop or computer is preferred (tablets and iPads can be used but may have limited functionality);
- Internet connection;
- Webcam;
- Headset with attached microphone (a gaming headset is ideal, but students with earbud headphone or notebook microphones are unable to participate in ESV classes);
- Preferred - access through firewalls to the internet to access Google Apps for Education and YouTube video clips (used both in lessons and to catch up missed classes);
- Preferred - a quiet space with no background noise, where students are free to speak as they participate in class conversations.

What are the expectations of students?

- To attend and actively participate in each lesson;
- To advise their school teacher and/or ESV if they will be absent from a lesson;
- To complete all work to the best of their ability and to ask questions of the ESV teachers.

What are the expectations of teachers?

- To ensure that students and parents/guardians complete all necessary permissions and forms before the commencement of classes;
- To monitor student attendance in ESV classes and follow up on notifications of student absences by ESV staff;
- Optional - to attend ESV classes, become familiar with content, and incorporate content into own lessons.

Who will these programs suit best?

The programs will be most suitable for Year 9 and 10 students who are passionate about science and wish to extend their knowledge into areas not part of the current Science curriculum in schools.

Students will be expected to be online for both one-hour lessons each week, which will be delivered at set times during the normal school day. Students should be released from normal classes to attend these lessons, in much the same way as occurs for instrumental music lessons.

Biotechnology and Bioinformatics

Explore how we use technology to understand DNA and genetic codes. Students examine the structure and function of the cell, DNA and proteins, the development and uses of genetic technology. Students will gain a range of experiences in state-of-the-art laboratory techniques and how biotechnology is changing every aspect of our world.

Frontiers of Physics

Investigate some of the most recent developments in the fields of astrophysics and quantum mechanics. Go on a journey through the Universe where they explore weird and wonderful phenomenon such as black holes and dark energy. They investigate the potential for life in the universe, how stars form and how they die. Explore theories that led to the development of quantum mechanics and particle physics, and the experiments that today’s scientists use to test these theories.

Nanoscience and Nanotechnology

Nanotechnology integrates chemistry, physics, biology, engineering and material science. Students are introduced to fundamental scientific ideas that contribute to the unique properties of substances on the nanoscale. They study how scale and the properties of materials are linked, and how this leads to unusual and unexpected behaviour of materials. This understanding of nanoscience is extended to explore how properties of nanoscale materials can be exploited in a range of current and developing applications, and to gain insight into how nanotechnology could play a role in solving global issues.

Mathematical Logic 2 Magic

Standing on the shoulders of giants like Archimedes, Escher, Mandelbrot and Fibonacci, students will explore numbers like pi, phi, & tau, mathematics of higher dimensions, mathematical art including tessellations and fractals, and the magic behind card shuffling and mental arithmetic.