BioLAB’s aim is to engage and inspire the next generation into Science and Mathematics careers using innovative technologies and techniques.

Our programs are themed using Sport and Human Performance and are linked to the AusVELS. We build our unique experiences around a number of Science, Technology, Engineering and Maths career pathways.

We cater for primary through to VCE students accommodating different stages of learning and ability with a special focus on disadvantaged and rural schools.

BioLAB programs are intentionally cross curricular and are designed to cater for more than just Science and Mathematics classes!

Our programs can also be successfully integrated into learning areas such as Physical Education, Health, Design & Technology and English.

We are able to emphasise various learning areas in each of our programs to meet individual class requirements.

There are two modes of delivery for BioLAB’s programs, onsite visits to our state of the art facility and outreach visits to your school – including physical visits and online programs.

All programs at BioLAB deliver cutting edge, engaging educational content and integrate the use of the latest ICT and AV technologies.

We offer full and half day program experiences which can encompass one or more of the programs you see in this information package.

“OUR TALENTED & EXPERIENCED STAFF ARE LOOKING FORWARD TO MEETING YOU!”
Your body is an amazing biological machine. It is capable of things that still remain a mystery to us.

Beat That will take students on a wonderful journey into the amazing world of the human cardiovascular system, focusing on the heart and circulatory system. Beat That introduces applications of medical technologies and exercise science equipment. Students will learn about their own cardiovascular system, collect and analyse their own heart rate data using graphs, and mathematical analysis techniques.

**KEY THEMES:** Anatomy, Cardiovascular System, Benefits of Exercise, Data Analysis and Graphing.

**SUITABLE FOR:** Year 5-8

**PROGRAM DURATION:** 2 hrs

**MAX CLASS SIZE:** 28

A great introduction to basic biochemistry and the way in which we can monitor metabolism during exercise. This program addresses outcomes in Units 3 and 4 of the VCE Physical Education Course.

We use our innovative Deakin Human Performance Lab to introduce key themes that allow students to analyse and investigate primary data. This program will include a VO₂ Max test, as well as students collecting their own blood pressure, tidal volume and core temperature for analysis. Presentation and analysis will occur with BioLAB’s resident sport scientist.

**KEY THEMES:** Energy Systems, Gas Exchange, Respiratory Rate, Heart Rate, Blood Pressure, Oxygen Deficit and Debt

**SUITABLE FOR:** VCE PE (Units 3 and 4)

**PROGRAM DURATION:** 2 hrs

**MAX CLASS SIZE:** 24

**BOOKINGS INFO:** In 2015 we are running Metabolic Madness March and May! During these months we can offer many booking options for this program. We also offer this program throughout Term 2 and 3, however bookings are limited...So get in QUICK!
Get your labcoat and goggles on because this activity introduces students to basic lab skills and cutting edge research quality laboratory equipment.

We take an adventure into the human body looking at a number of important components such as the skeletal, muscular and nervous systems, cells, and DNA.

Students work in small groups with mentors to perform chemistry experiments, problem solve and utilise technology such as electricity kits, microscopes and ipads.

**KEY THEMES:** Biology, Chemistry, Working scientifically, Science inquiry skills, Science as a human endeavour, Data collection and analysis, Units of measurement.

**SUITABLE FOR:** Years 5-6  
**PROGRAM DURATION:** 2 hrs  
**MAX CLASS SIZE:** 28
Skin Deep introduces the body’s largest organ and the role it plays in controlling body temperature. Students gain a deeper understanding of the structure and function of skin, including variations in thickness, skin mass and body temperature. They also investigate the effect that exercise has on body temperature using our physiological sensors and data loggers.

Students use science inquiry skills; observation, questioning, predicting and inferring, to create an experiment which helps demonstrate how advances in technology can benefit athletes in controlling body temperature. They discover how these materials can improve human performance by directing blood flow to where it is needed the most.

**KEY THEMES:** Biological science, Working scientifically, Science Inquiry skills, Science as a human endeavour, Data collection and analysis.

**SUITABLE FOR:** Year 5-8

**PROGRAM DURATION:** 2 hrs

**MAX CLASS SIZE:** 28

Welcome to the inner sanctum of the Geelong Cats and the cutting edge science and maths of footy! The Geelong Cats employ a team of scientists and mathematicians to help ensure that their athletes are able to analyse and refine their performance and technique to gain the winning edge.

BioCATS is run from the new Deakin Cats Community Centre at the Simonds Stadium as a full day program. Students and teachers participate in dynamic scientific experiments, using problem solving, statistical analysis and observation skills to learn about the science and maths of football and career pathways in sport. The program also reinforces the concepts of health and wellness and the benefits that come from sports participation.

**KEY THEMES:** Graphing, Data Analysis, Problem solving, Nutrition, Training Principles, Recovery Methods, Materials Technology.

**SUITABLE FOR:** Year 5-6

**PROGRAM DURATION:** Full Day (MONDAY ONLY)

**MAX CLASS SIZE:** 56 (2 classes of max. 28 students)
Athletes are always searching for the edge in their performance. We are seeing a large number of engineers, mathematicians and scientists now working exclusively in developing equipment and clothing that can assist athletes in going faster, higher, stronger.

This program looks at local surf equipment legends RipCurl and their search for the perfect wetsuit. Students get the chance to perform a number of industry tests which give them an insight into human physiology, thermal imaging, textile and fibre testing and development of cutting edge sport equipment from concept to the consumer.

This program is supported by Ripcurl and Deakin University’s Sports Design Technology team and showcases a number research projects, career pathways and exciting developments right here in Geelong!

**KEY THEMES:** Materials Technology, Engineering, Design and Research Development.

**SUITABLE FOR:** Year 9 - 10, VCE PE (Unit 1),

**PROGRAM DURATION:** (4hrs) Full Day

**MAX CLASS SIZE:** 28

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The Fast and the Curious explores how forces affect sporting performance. This physics based program utilises force platforms, dynamometers, radar speed guns and timing gates to measure forces that act on students during a range of activities.

Students use their mathematical skills and a range of experiments to generate their own data for analysis back in the classroom. Students determine the many physical elements that determine sporting performance and use their understanding of mathematical relationships (trends, ranges, means, correlations) to analyse results.

**KEY THEMES:** Forces, Energy and Mathematical Analysis.

**SUITABLE FOR:** Year 7-8

**PROGRAM DURATION:** 2 hrs

**MAX CLASS SIZE:** 28
SPRINTERS GENE

Sprinters Gene is a unique introduction to the concepts of genetic diversity, analysis and manipulation.

Students use cutting edge biotechnology equipment to analyse protein and DNA samples and investigate the presence of the ACTN3 gene (Sprinters Gene) in athletes. Students also look at the process of gene doping and go through the process of gene doping a bacterial colony and measuring the success rate of this process.

This program covers content that can be used for the following SACs:

- An investigation using a DNA tool or manipulation technique.
- A response to an issue related to human intervention in evolutionary processes.

KEY THEMES: Biotechnology Manipulation Techniques, Genetic Diversity and Gene transformation.
SUITABLE FOR: VCE Biology (Unit 4)
PROGRAM DURATION: 4.5 hrs (Full Day)
MAX CLASS SIZE: 24

COME CLEAN JUNIOR

The human body is capable of many things and we are constantly pushing it's limits. This activity looks at the concepts of sporting performance and the way in which an athlete can improve.

Students are introduced to the basic chemistry and biology of the human body and challenges them to investigate some mystery athletes.

Students and teachers work in small groups with mentors and independently report their results to our scientific delegation.

This program is also a great introduction to drug and alcohol education and discusses a number of relevant issues in sport and society.

KEY THEMES: Biology, Chemistry, Scientific Method, Sport and Society, Scientific Communication.
SUITABLE FOR: Year 5-6
PROGRAM DURATION: 2 hrs
MAX CLASS SIZE: 28
BioLAB Sports Testing Laboratory has a number of athletes to screen and we require students to take on the role of Testing Officers! Using experimentation, analysis and communication skills we require your assistance to report back to Head Office.

This program converts our Molecular Biology Lab into a dynamic Athlete Testing Facility taking students through the process of screening athletes for performance enhancing substances.

It will introduce students to basic molecular biology, protein structure and the use of research class equipment (Spectrophotometry) and chemistry processes.

The program also introduces a number of performance enhancing substances and their effects on the human body.

**KEY THEMES:** Biotechnology, Chemistry, Physiology and Biology (Proteins) and Graphing Data

**SUITABLE FOR:** Year 9-10

**PROGRAM DURATION:** 2 hrs

**MAX CLASS SIZE:** 28

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Eye in the Sky will expose students to leading edge GPS athlete tracking equipment including our real time feedback system measuring distance, speed and heart rate. Students will also utilise iPads for skills mapping and biomechanical analysis.

Students will analyse and generate their very own primary data sets in areas such as: work to rest ratios, movement and locomotor patterns, and skill frequencies.

This is a wonderful way to look at performance and game analysis in sport and has many applications across Physical Education, Maths and Science.

**KEY THEMES:** Biomechanics, Physiology, Data Analysis, Mathematical Modelling, Graphing and Scientific Communication.

**SUITABLE FOR:** Year 10 - VCE (PE Unit 4)

**PROGRAM DURATION:** 2 hrs

**MAX CLASS SIZE:** 24
Are we coded for success? This program investigates the link between genetics and sporting success.

Students will use cutting edge technologies to screen athletes and maximise individual sporting success by matching genetic profiles to sports. The link between gene products and specialised cells will be examined as students explore the functionality of various cell types and the impact of these on sporting success.

Students will use gel electrophoresis and microscopic techniques to unlock the secrets of mystery athletes and gain a better understanding to the role our DNA plays in sporting success!

KEY THEMES: Genetics, Biotechnology, Microscopy, Physiology and Cellular biology.

SUITABLE FOR: Year 7-10  
PROGRAM DURATION: 2 hrs  
MAX CLASS SIZE: 28

This program utilises leading edge technologies such as ergometers, physiological sensors, iPads and our Deakin Human Performance Laboratory to explore the acute effects of exercise and the science of human performance.

Students learn experientially, immersing themselves in a range of physiological tests to look into the human body’s response to exercise and training. It looks at three distinct areas of physiological measurement, cardiovascular, muscular and respiratory. Students gather their primary data and create a scientific presentation to communicate findings back to the class.

Students also take the data generated at BioLAB back into their classroom for further analysis and experimental write up.

KEY THEMES: Physiology, Sport Science and Wearable Technologies.  
SUITABLE FOR: Year 9 - VCE PE (Unit 1)  
PROGRAM DURATION: 2 hrs  
MAX CLASS SIZE: 28
This program is designed to give students a hands on introduction to university and research level anatomy, physiology and biomechanics. Its a great introduction to exercise, health and medical science career pathways.

The Winning Edge is run from the brand new state of the art School of Exercise and Nutrition Sciences at Deakin University’s Waurn Ponds Campus.

Students will experience cutting edge technologies allowing them to measure force, gait analysis, predictive VO\textsubscript{2} max and power. They use anatomical terms and models to further investigate the human body.

**KEY THEMES:** Anatomy, Physiology, Biomechanics and Career Pathways.

**SUITABLE FOR:** Year 10-12 (VCE PE Units 1-4)
**PROGRAM DURATION:** 3.5 hours
**MAX CLASS SIZE:** 28

Nutrients are paramount to the success of athletes and this program will highlight the depth of science that goes into numerous science nutrition products that are on the market today. After an exploration of analytical chemistry techniques, students will analyse product to verify nutrient content and then apply this information to make recommendation to athletes.

Students will use their problem solving skills and micro pipetting and spectroscopy techniques to prepare standards, determine a standard curve and all apply their results to reveal nutrient content of samples.

**KEY THEMES:** Spectrophotometry, Standard Curves, Sports Nutrition and Biomolecules

**SUITABLE FOR:** VCE Chemistry (Unit 3,4)
**PROGRAM DURATION:** 2 hrs
**MAX CLASS SIZE:** 24
Helping to build teacher capacity and confidence in science and mathematics.

BioLAB aims to provide a range of events, programs and resources to teachers. We want to make it as easy as possible for teachers build upon the experiences that they have with their students during a visit to the centre. Here are a range of teacher focused activities that we would like you to know about!

**Teacher Resource Kits** are developed for many of our programs. The kits are provided to each of the teachers on completion of the program. We prepare these comprehensive resources to assist teachers to build upon the content of the BioLAB programs. They provide AUSVELs curriculum links, rich learning tasks, thinkers skills, and lab activities for the classroom.

**BioLAB Events and Seminars** are held throughout the year in a number of key theme areas, teachers who book into our programs will have exclusive access to our events calendar which includes relevant industry nights, conferences and information evenings.

Teacher Professional Development is run throughout the year at BioLAB. We have two key programs in 2015.

- **BioBLAST** - A professional development program which aims to build teacher capacity and confidence in the teaching of science within 5 regional disadvantaged schools. If you are interested in applying for this program please contact us. Schools will be asked to submit an application in Term 1, 2015.

- Our **BioLAB in a Box program** will return for 2015! This program involves a comprehensive science resource kit being delivered to one upper primary class and includes teacher professional development and mentoring so the resource can be used throughout the school. Call us for further details (Numbers will be limited).

“IT MIGHT ONLY TAKE A SPARK OF INSPIRATION TO IGNITE A LIFETIME LEARNING”
BIOLAB: The Victorian BioScience Education Centre is proudly supported by lead partners Deakin University and is hosted by Belmont High School, in Geelong Victoria