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 AusVELS. We build our unique experiences around a number of Science, Technology, Engineering and Mathematics 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 through 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.

The senior version of this program (Yr 7-8) looks further into the function of the cardiovascular system during exercise including heart rate training zones and recovery.

**KEY THEMES:** Body systems, Cardiovascular system, Benefits of exercise, Data analysis and Graphing.

**SUITABLE FOR:** Year 5-8  
**PROGRAM DURATION:** 2 hrs  
**MAX CLASS SIZE:** 28

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
Get your lab coat and goggles on because this activity introduces students to basic lab skills and cutting edge research laboratory equipment.

We take students on 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 scientific technology, such as microscopes and iPads.

**KEY THEMES:** Body systems, 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

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The human body is capable of many things and we are constantly pushing its 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
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:** Body systems, 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 mathematics 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 Deakin Cats Community Centre at 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 mathematics 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:** Science (Yr 9 - 10), Design & Technology and VCE PE (Unit 1), VCE Outdoor Education (Unit 2,3)

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

**MAX CLASS SIZE:** 28

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**METABOLIC MADNESS**

A great introduction to basic biochemistry and the way in which we can monitor metabolism during exercise. This program addresses outcomes in VCE Biology and Physical Education courses (Units 1-4).

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 VO$_2$ Max test for a nominated student, as well as all students collecting their own blood pressure, vital capacity, heart rate 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, Cellular respiration and Homeostasis.

**SUITABLE FOR:** VCE Biology and PE (Units 1-4)

**PROGRAM DURATION:** 2 hrs

**MAX CLASS SIZE:** 24
**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.

**PLEASE NOTE:** This program is not run under SAC conditions and is suggested to be used as a practical laboratory experience. Post program, students will be able to report on:

- 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.

**SUITEABLE FOR:** VCE Biology (Unit 4)

**PROGRAM DURATION:** 4.5 hrs (Full Day)

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**THE INNER SANCTUM**

The Inner Sanctum delves into the amazing world of human psychology and the relationship between mind and body.

This program introduces various methods and techniques used by sports psychologists to train elite athletes. Students utilise physiological and psychological methods to identify personality traits, monitor the stress response and collect their own performance data using our Batak reaction time and Smart Speed timing gate systems.

This program introduces the analysis, organisation and representation of quantitative data in psychology and mentors work with students to draw conclusions and generalisations based on class results.

**KEY THEMES:** Sport Psychology, Relationship between arousal and sporting performance, Yerkes-Dodson law, Personality tests, Research methods and analysis of data.

**SUITEABLE FOR:** Years 8 - 10

**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, Role of proteins, and Graphing data

**SUITABLE FOR:** Year 9-10

**PROGRAM DURATION:** 2 hrs

**MAX CLASS SIZE:** 28

Eye in the Sky will expose students to cutting edge GPS athlete tracking equipment including a 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:** Skills Analysis, Movement Patterns, Work rest ratios, Sports Technology, Graphing and Scientific Communication.

**SUITABLE FOR:** Year 7-10 - VCE PE (Units 1-4)

**PROGRAM DURATION:** 2 hrs

**MAX CLASS SIZE:** 24

*New in 2016! Eye in the Sky for lower secondary years 7,8.*
The Brain is the most amazing computer and it’s inside us! Brain Matters takes students on a journey of the human brain exploring the anatomy and function of the brain and using technology to experiment and learn more about their own brain function.

Students apply their knowledge to functionally test each part of the brain. They explore and answer questions, manipulate materials, and test ideas.

Students use technology to conduct a number of experiments to explore reaction time, balance, psychology and physical activities effect on brain function. Technology used includes; batak reaction timing system, timing gates, iPads and iClickers.

**KEY THEMES:** Body systems, Data collection and analysis, Central nervous system.

**SUITEABLE FOR:** Year 5,6

**PROGRAM DURATION:** 2 hrs

**MAX CLASS SIZE:** 28

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Join Madi Robinson (Melbourne Vixen and Australian netballing sensation) for a Meet the Athlete experience with your students!

This program provides students with real life science application and experiences in elite sport settings. Gain a first hand insight and work with Madi on athlete training, hydration, nutrition, recovery and rehabilitation. Madi brings a wonderful dynamic to our 2016 program with her teaching background and her personal experience using science as an elite athlete.

The program covers the following areas: Nutritional requirements, Hydration analysis, Glucose testing, Electrolyte balance, Exercise, recovery and rehabilitation methods.

**KEY THEMES:** Science of nutrition, hydration and recovery.

**SUITEABLE FOR:** Years 7-10, VCE PE (Units 1-4)

**PROGRAM DURATION:** 2 hours

**MAX CLASS SIZE:** 28
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 performance. 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 and injury.

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 acute response to exercise. 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: Physiological responses to exercise, Sport science and Wearable technologies.
SUITABLE FOR: Year 9 - VCE PE (Unit 1-4)
PROGRAM DURATION: 2 hrs
MAX CLASS SIZE: 28
This program provides a hands-on experience in chemical sciences and its application to everyday life.

Students put themselves in the shoes of a quality control testing officers and join the BioLAB staff to solve a few sporting products mysteries.

Students apply their problem solving skills as they identify the main ingredients of BioLAB’s new range of sports nutrition products. They learn to critically evaluate information they see in their everyday life as consumers.

Scientific knowledge collected during the investigations is then applied to real-world applications to evaluate claims and suggest improvements.

**KEY THEMES:** Chemical and physical change, classification of properties, fair testing, application of knowledge to real-world aspects.

**SUITABLE FOR:** Year 5, 6  
**PROGRAM DURATION:** 2 hrs  
**MAX CLASS SIZE:** 28

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Wearable technology has made monitoring our health and wellbeing a part of daily life. But what does all this data mean?

We have class sets of wearable technology devices which allow you to complete a number of mathematical, scientific, and health investigations with students. A box of devices will be dropped off to your school and students wear them for a full day of activity. BioLAB specialists then visit your classroom to analyse the heart rate, energy expenditure and distance data, leading students through a number of guided investigations using tablets and interactive software.

This program is a wonderful way to introduce your students to data analysis using personal and class data sets, present methodologies, findings and conclusions as a scientific poster.

**KEY THEMES:** Physiology, Energy expenditure and Wearable technologies, Data analysis and Scientific poster development.

**SUITABLE FOR:** Year 7 - 10  
**PROGRAM DURATION:** 1 day data collection, 2 hrs BioLAB visit  
**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 VO₂ 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
This program is designed to give students an insight to the applications of sport and exercise science in a sporting environments. Students are hands on with state of the art equipment and technology and conduct three investigations:

- GPS Data Analysis - Investigating and manipulating their own GPS information including; distance, speed, heart rate and map data.
- Elite Testing - Analysing what VO2 Max testing is and how it can be used to determine an athlete’s cardio-respiratory endurance.
- Physiology Lab - Using physiological sensors and real time datalogging to investigate acute response to exercise. This investigation focused on heart rate training zones and recovery times.

**KEY THEMES:** Physiological responses to exercise, Sport science and Sports testing.

**SUITE FOR:** Year 9 - 10

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

**MAX CLASS SIZE:** 28

Are you planning a ski trip in 2016? Why not include some sport science and technology? BioLAB and Deakin Sports Engineering team have come together to design a number of discrete educational experiences that can enhance your learning on the mountain. We meet you on the mountain and bring the cutting edge technology and programs to you!

Have you ever wondered what sort of testing and research goes into designing your equipment and clothing? Our BioLAB specialist can unlock the world of sports engineering and design and demonstrate some of the techniques used to design the latest snow gear and equipment.

Or how about using GPS athlete tracking technology to monitor your performance on the slopes! We guide the students through analysis of their performance data and produce a scientific poster.

**KEY THEMES:** GPS technology, speed, distance, materials technology, sports engineering

**SUITE FOR:** Yr 7-12

**PROGRAM DURATION:** dependent on agreed program

**MAX CLASS SIZE:** 24 per session (each session approx 2 hours)
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 throughout the year:

- **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.

- **STEM Teachers Networks** - we host two regional teachers networks that meet twice a term. The Primary network is focused on STEM in upper primary and the Secondary network is focused on yrs 7-10 STEM. Each meeting includes professional sharing, professional development opportunities and mentoring. If you are interested in attending network meetings please contact us for further details.

“IT MIGHT ONLY TAKE A SPARK OF INSPIRATION TO IGNITE A LIFETIME LEARNING”
Booking Reference No: __________________**

*Office Use Only

School Name: _________________________________________________________________

School Address: _______________________________________________________________

City: __________________________________________ State: _______________ Postcode: __________

Teachers First Name: ______________________ Surname: ___________________________

Teachers Contact Phone/Mobile No: _____________________________________________

Email: ________________________________________________________________________

* Please note we use email as our primary contact method.

BioLAB Program Name:_________________________________________________________

Preferred dates 1: ________________________________ 2:___________________________

Session Times 1:__________________________________ 2:___________________________

Subject Area:___________________________________________ Year Level: ____________

No. of classes: ________________ No. Students: _____________ No. Staff _______________

(include Aides/Parents)

Students with Medical or Disabilities:____________________________________________

(eg: asthma, heart or lung conditions etc)

WHAT’S NEXT?...

Email this form to: admin@biolab.vic.edu.au OR Fax to (03) 4245 4121

We will contact you as soon as possible to confirm if your requested dates are available.

If you would like to discuss the booking further with one of our education staff please contact us on (03) 4245 4100 between school hours Monday - Friday.