



Doctrina Vitae

Bacchus Marsh  
Grammar

# GRAMMARIAN





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# Bacchus Marsh Grammar



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# FROM THE PRINCIPAL

The school is pleased to announce that work has commenced on a major new \$7.2 million dollar project for the Senior School. The Senior Study Complex will see the replacement of the oldest buildings in the school with a modern three-storey complex for senior students.

The first two floors of the complex will consist of twelve classrooms and additional toilets. The third floor will be a new study centre for Year 12 students.

In developing the complex, the school has looked to provide spaces that can be transformed to suit a variety of different teaching and instructional styles. Equally, the new Senior Study Complex has a focus on providing spaces

that enhance small group tutorial learning and a greater emphasis on peer study groups.

The new building will provide students with a new range of spaces which will assist in developing better student outcomes. The development of the new facility will see the demolition of a number of current facilities. This will also provide the school with the opportunity to redevelop and landscape the centre of the school to provide a new focus quadrangle, with expanded passive and activity areas for senior students.

**Mr Andrew A. Neal**



Artist's impression

# EARLY LEARNING CENTRE - WOODLEA

Our Early Learning Centre opened in 2017 with approximately 45 families enrolled enabling 30 children to attend each day. During our first year we offered programs for 2-3 year olds, 3-4 year olds and an integrated Kindergarten program to 4-5 year olds.

Since our inaugural year we have grown to now enrolling 100 children, offering a program for children aged 3-4 years and two integrated kindergarten programs for 4-5 year children

Our biggest accomplishment for educators and management was our achievement in our Assessment and Rating visit in March 2018. The centre was awarded an Exceeding rating; the highest rating a centre can be awarded. This reflects the quality of our educators, our program and our service.

We have also been awarded “The Little Scientist House” which is an inquiry based learning in the STEM program.

All our curriculum is delivered with a balance between intentional teaching, project work and incorporating the strengths and interests of the child.

Project work includes:

- Indigenous studies
- Space
- Oceans
- Land
- Volcanoes

Our project work involves all children and can be part of our program for the whole term.



Throughout the Kindergarten program we will develop the children's foundation skills for numeracy and literacy, as well as resilience, problem solving, self-regulation, spatial awareness and the creative arts. The children also participate in the ELLA (Early Learning Language Australia) a digital language based learning program. The language they learn is Indonesian which is carried through to their Prep year.

Incursions included:

- Museum – Dinosaurs
- Western Water – Water is precious
- Local Rockbank Fire Brigade
- Cultural Infusion
- Wild life Xposure

Excursions included:

- Visit to the Woodlea Community garden
- Visit to the oval at the playground
- And our new excursion "Beyond the Fence", an outdoor experience at a bush block at our Maddingley campus to be introduced Term 3 this year

Celebrations included:

- Mothers' and Fathers' Day evenings for all groups
- Welcoming Picnic in the Park
- Christmas and end of year celebrations – Picnic in the Park
- Naidoc week, Book week and Diwali

As each year passes the Centre grows within and the curriculum develops into a rich learning environment for the children, families and staff. We look forward to 2020 and beyond where many more projects will be introduced.

**Mrs Kerry Osborn**  
**Director of Early Year Education**





## SYSTEMS ENGINEERING STUDENTS SHINE AT BMG

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The Technology Department at Bacchus Marsh Grammar has expanded the range of course offerings over the last few years. The subjects leading towards a Systems Engineering stream now include Coding, and Design Technology at Year 7 and 8, and Mechatronics, 3D Printing Technology and Flight Technology at Years 9 and 10. VCE Systems Engineering commenced in 2015 with Units 1 and 2, and the first year of Units 3 and 4 began in 2016.

In 2018, we were proud to have the achievements of two of our Unit 3/ 4 students recognised at a state-wide level. Stuart Campbell achieved a perfect score of 50 for his Unit 3/ 4 studies and was awarded a Premier's VCE

Award which was presented at the Melbourne Convention and Exhibition Centre in June. Nazeeha Moosajee was one of eight students from across the state to have her Unit 3/ 4 Systems Engineering project included in the Top Designs exhibition held at the Melbourne Museum. This is an outstanding achievement for both students, and we congratulate both students on their hard work and dedication. In acknowledging the work of these students, we gave them the opportunity to reflect on their studies and the skills they had developed through VCE Systems Engineering.

**Mr Rohan Bryan**



### **NAZEEHA MOOSAJEE - ONE OF EIGHT STUDENTS SELECTED TO DISPLAY HER WORK IN TOP DESIGNS – SYSTEMS ENGINEERING**

#### *Why did you choose to study Systems Engineering?*

Systems Engineering was a subject in which I saw the creative freedom and versatility to create fun and interesting projects in their full diversity from music through to vision and medicine. All the emerging ideas that will shape our future like data science and artificial intelligence are enabled by the study of this subject. There is this also this massive movement of creative people who call themselves makers who are doing truly inspiring work, pushing the boundaries of what can be reasonably put together by novices culminating in electronics, computing and mechanical aspects and freely sharing their triumphs. I wanted to be part of that culture. There is no part of the future that will not be touched by systems type thinking and the skills learnt in Systems Engineering will likely become useful in every other field of study I might choose in the future.

#### *What skills did you learn from other subjects that prepared you for Systems Engineering?*

Prior to picking up Systems Engineering Unit 1 in Year 10, I took the subject Mechatronics in Year 9. Mechatronics provided me with a very insightful platform; allowing me

to shape a scope of possibilities for projects I had the ability to develop and create within the limited time-frames available. The 'systems engineering process' - introduced in Mechatronics was an aspect of Systems Engineering folio management that constantly required clarification and fine tuning - thus the prior exposure was very helpful in allowing my final VCE folio to meet all the necessary criteria. I was ambitious with my Mechatronics folio projects but it gave me some context to pause and consider the size of the bite I could reasonably be able to chew. It is easy to come up with a grand idea and be outwitted by constraints of resources of materials, staff, time and own skill set.

#### *What did you enjoy most about Systems Engineering?*

I enjoyed the freedom present in the classroom space. The ability to engage in basic work in class building foundations while reaching for the stars researching ideas and work of other technologists and makers provided freedom of expression akin to an Arts subject. No two projects are the same in this class and each is challenging in trying to fulfil some requirement as elegantly as possible. The level of depth of substance in the projects was only limited by the ability of the student to assimilate the concepts into reality to achieve desired outcomes by mustering all available resources i.e. teachers, internet, magazines, books, friends etc. In addition to this, the collaborative classroom space allowed for entertaining conversation - and the partnership of students to help bring each other success in their chosen projects.

#### *What did you find challenging about Systems Engineering?*

The subject is very challenging as it often requires a dive deep into electronics, computing, software/code, mechanisms, enclosures, ergonomics etc. With the limited level of knowledge acquired through course work, there is nothing to prepare one for limitations of real world constraints such as the ability of a microcontroller to compute in real time to produce an artefact free of sound or influence of electromagnetic interference in the success of a final year systems project. Most of the things we take for granted in our lives like mobile phones are very complex entities that take teams of seasoned professionals to conceive, produce and sell for an affordable price. In a Systems Engineering project, you very quickly discover the knowledge and resource gaps in play and what requires you to manage these elements of complexity through careful and practical choices, sometimes needing to backtrack to some compromise as I needed to do myself in my projects. This can be very challenging if not supported by various support people the student has to have available on short call for guidance.



### *What advice would you give to students beginning to study Systems Engineering?*

My advice would be to get the theory down early and read widely. Practice and experiment with all the concepts you learn in class and look at various projects being done by people like yourself, not only around the world, but your fellow classmates as well. Get inspiration from these projects and choose to do your own project reflecting what you can reasonably expect yourself to pull off in the time and with the resources that are available to you. Become fluent in the use of mechanical CAD software and electronic simulation/design and software tools - as the tool could not only come across as handy when developing the physical structure of your chosen project - but equip you for your endeavours even after school. And finally, above all, dream big and do something challenging. It will inspire you to do bigger and better things later in life.

### *What inspired your Systems Engineering project?*

My systems engineering project was an evolution of previous projects completed in Mechatronics and early units of the course. I have a huge interest in music and play the piano. My Mechatronics projects were focused on musical sound synthesis instruments like the Theremin, granular synthesisers and programmable sound synthesis based on the Raspberry Pi. These projects taught me a thing or two about issues pertinent to generating high

quality sounds with small 8 bit microcontrollers and latency issues with external inputs when an operating system like linux on a Raspberry Pi is involved. I had been reading about other efforts in the maker space and came across a small microcontroller board called a Teensy that was being used as sound processor for guitar effects and also an electronic tone wheel organ. The Teensy board supported sound generation through high quality signal processing paths and output through a dedicated digital audio converter operating at CD (compact disc) sampling rates. I had also wanted to explore touch type input and the Teensy processor was able to handle a limited number of capacitive touch inputs too. So from this set of resources, I looked at a musical instrument idea and proposed a synthetic version of a hang drum which is an acoustic percussion instrument, and tried to emulate it as closely as possible using electronics computing and touch paradigms. The hang drum is notoriously difficult to make and is likewise very expensive to buy as it involves painstaking adjustments to mechanical cavities in an otherwise smooth dome shaped shell of steel. Due to this, I felt the need to make something that could be more readily produced and played. And so was born the electronic handpan! This instrument can be infinitely customised for key tones and placement and allows quick changing of the scale in which the instrument is played, making it far more versatile than the original hang drum.



*What skills do you think you acquired throughout your Systems Engineering project(s)?*

The skills I have acquired through my Mechatronics and Systems Engineering projects have mainly focused on embedded electronics and computing. There have been mechanical aspects too. While making the enclosure for the electronic handpan and servo movements for the face tracking camera I made in the second Mechatronics semester. The systems nature of each of these projects have provided me with a solid handle for the co-design requirements of hardware and software, the computation price of real time computer processing, the concept of form, feel and function in the design of the various projects as well as the discipline to document the work in a folio to meet the subjects marking criteria. Each of my projects has brought with them unique challenges and expanded my knowledge enormously. I now have a good feel for what makes every day stuff around me work and what I may be able to do to make that product better than it is now, or to create something entirely new to meet some unmet need.





**STUART CAMPBELL - WINNER OF A PREMIER'S VCE AWARD FOR HIS SCORE OF 50 IN SYSTEMS ENGINEERING**

*Why did you choose to study Systems Engineering?*

I chose to study Systems Engineering because many of the previous subjects I have taken led on very well to it. The ability to build and create something as part of a VCE subject was also very enticing, allowing me to be both create as well as learn a new set of skills.

*What skills did you learn from other subjects that prepared you for Systems Engineering?*

Throughout my subject selection in Year 9/10 including Flight Technology 1/2/3 and Mechatronics I learned to use multiple CAD related programs and gained the knowledge required to get an understanding of the intricacies of the CAM processes available at the school. I also learnt to write in the form required for an engineering folio, adopting a voice in my writing that I previously rarely had to use. Good time management skills cannot be understated as they popped up in all of the folios throughout Systems Engineering and was instilled in us in previous classes.

*What did you enjoy most about Systems Engineering?*

The classes were all engaging and the ability to relate all the knowledge learnt both to a project of my own creation and the greater world around me was really encouraging

and made it all tangible in a way many other subjects do not. Although it is common to learn equations about how things work, it is only when you see it in the everyday items around you do you appreciate the significance and the amount of thought that goes into even the simplest machines. Being able to learn about certain components and then pull apart something to understand and recognise components after just learning about them was very enjoyable and created a real passion for the subject. The group discussions and jokes were also great.

*What did you find challenging about Systems Engineering?*

Building to a schedule whilst maintaining scope for the folios was very challenging. A year is a lot shorter than I thought and I quickly realised my grand plans for a massive project were going to need to be paired with an equally comprehensive folio (or cutting it down to something more manageable). Finding the time for the amount of out of school work was challenging but an interest in the subject was able to counteract this.

*What advice would you give to students beginning to study Systems Engineering?*

Enjoy it: it has more practical classes than any other subject I've taken. The joy that the whole class feels when anybody gets something small to work is unequalled in any other subject so put effort into it. It ties over to many other subjects too.

Don't do too big a folio: you can write just as much on something small as you can on something large and it will be more in depth.

Make use of the teachers: they know a lot and they're always available... they only had to deal with me for about 200 lunchtimes, and the occasional recess break, for 3 years.

*What inspired your Systems Engineering project?*

Personally, I really enjoyed the flight subjects, found them really interesting and because of them I had an understanding of my project before I undertook it, it really helped with the background information and troubleshooting. Drones had also been a hot topic of discussion in the news and within the greater community and I thought the skills from it would tie in nicely with further projects.

*What skills do you think you acquired throughout your Systems Engineering project(s)?*

Adopting a technical mindset (troubleshooting, simplifying problems, writing practicals, designing efficiently, principles of design, and CAD/CAM processes).



# STAUGHTON VALE CAMPUS – MIDDLE YEARS PROGRAM

The Staughton Vale Middle Years Program has become a regular learning opportunity for our Year 6 and Year 8 students in 2019. A day on the farm and learning in the outdoors provides an opportunity for our students to extend their learning beyond the classrooms at BMG. Both Maddingley and Woodlea campuses have experienced a number of days at the farm this year, enjoying the chance to explore and learn about the property. All students have been involved in a farm induction involving aspects of safety, farm skills and healthy food choices and are then set to take in all of the wonderful learning opportunities that the farm has to offer.

This semester, the Year 6 cohort has experienced the following themed days:

- How do animals adapt to their habitat?
- How do humans interact with the environment?
- How has fire shaped our land?

The Year 6 students have used these experiences to understand the environment in which Staughton Vale is situated. The various scientific and geographical sessions have enabled them to build their enquiry skills and to develop a deeper connection to their surrounding environment. Visiting Serendip Sanctuary in Lara provided a real world example of the endangered species of the Western Plains region and what students can do to help the native wildlife and the ecosystems which they inhabit.



The Year 8 cohort has experienced the following themed days this semester:

- What are the competing land users of the area?
- What factors contribute to healthy and reliable land?
- Will there be enough water in the future?

From these experiences, the students have worked together to build their critical and creative thinking, through investigating the various impacts humans have on our environment. The different Science, Geography and Personal Development sessions aim to develop knowledge, skills and motivations for action that contribute to their own well-being and that of the community and the natural environment.





Both years have been excited to get their hands a little dirty during the different farm based sessions and have had fun learning about the composting system, planted new vegetables and herbs in the vegetable patch, harvesting various fruits and vegetables including: watermelon, chillies, tomatoes, silverbeet, beetroot and a number of different herbs.

The final experience of the semester will see the Year 6 cohort explore the neighbouring Brisbane Ranges National Park and put their teamwork and leadership skills to the test, by completing the Anakie Gorge Bushwalk and discovering the many geographical features of Anakie Gorge.

Year 8 will continue to investigate the theme of water and how we can continue to develop a reliable water source for our future. They will explore the process of waste water treatment and visit the Upper Stoney Creek Reservoir to learn first-hand about our drinking water and the importance of safe water storage.

**Mr Bryce Durham**





# GRAEME FRISLIE – CYCLING SUCCESS

Graeme started cycling in America as a family hobby but when he moved to Australia with his Mum and Dad he joined the Ballarat Cycling Club and started racing. His talent on the bike was obvious from the start and it wasn't long before he joined the prestigious Brunswick Cycling Club in Melbourne.

Bacchus Marsh Grammar has provided Graeme with a fantastic opportunity to enhance his training through his involvement with the Elite Sports Program and its partnership with the FedUni WestVic Academy of Sport. Graeme dominated the Junior scene U15-U17 winning numerous State and National Titles and was awarded Junior Male Cyclist of the Year. He then accepted a Scholarship with the Victorian Institute of Sport in 2017.

Earlier this year Graeme was crowned Men's U19 Champion of Champions at the Australian Track Cycling National Championship at the Anna Meares Velodrome in Brisbane.

He was simply outstanding across several races, winning two Individual Gold medals in the 1km Time Trial and Scratch Race and a further two Team Gold medals by claiming the

Team Pursuit and the Madison. Graeme had already won the Gold medal in the Omnium National Championship in October last year.

Graeme won the Men's U19 Time Trial 1000m Final by producing a blistering 4 laps, winning in a time of 1:03.582. In the Men's U19 Scratch Race 10km Final, Graeme again reigned supreme, completing the race in a time of 11:54.76.

In the Team Pursuit Final, Graeme and his fellow Victorian riders claimed the Gold medal by defeating Queensland in a time of 4:07.679.

Whilst in the Men's U19 Madison 30km Final, Frislie combined with fellow Victorian, Bill Simpson, to defeat Western Australia and New South Wales teams over 120 laps, claiming the Gold medal in a time of 35:07.34.

Graeme's family, along with the School, could not be more proud and thrilled that he has been selected to ride for Australia at the 2019 UCI Junior Track Cycling World Championships in August in Frankfurt, Germany.

**Mr Andrew Perks**





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