



This handbook is designed for students, families and key school staff. It provides a summary of the CHES VCE programs, the application process and the expectations and requirements of studying a VCE subject at CHES.



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Welcome to CHES

Centre for Higher Education Studies (CHES)

Welcome to the next stage in your educational journey. At CHES we specialise in two highly regarded VCE studies of great appeal to high-ability senior students:

- VCE Algorithmics
- VCE Extended Investigation

CHES is a ground-breaking new centre of excellence that has been established to cultivate the potential of high-ability and high-achieving senior secondary school students. It is a direct response to the Victorian Government's intention that all students, regardless of their starting point, are supported to realise their full potential.

At CHES we offer VCE Extended Investigation and VCE Algorithmics to government school students across Victoria, including students in metropolitan, rural, regional, and remote areas and those from disadvantaged backgrounds. We're excited to be expanding access to these exciting VCE studies to an even more diverse group of high-achieving students than ever before. Through an innovative 'hy-flex' approach to teaching and learning, students will remain enrolled at their chosen government secondary school and undertake a VCE study through CHES, as a part of their VCE program. To accommodate as many eligible students as possible, these programs will be available through a hybrid and flexible approach, with opportunities to study online, on-site at CHES or a combination of the two.

This is an exciting time for students to become part of the inaugural intake of students into CHES across the state. Our programs will enable students to accelerate and deepen their learning. Students enrolled in one of our subjects will have the opportunity to lay a strong foundation for future university study, expand their knowledge and skills, challenge themselves, build networks with other high-achieving students, and continue building an impressive CV for the future while completing their overall VCE program. Students who undertake a VCE subject at CHES will also have access to our CHES Student Enrichment Series, which includes masterclasses with a range of universities and mentoring opportunities with university students and academics.

At CHES we are forward thinking. We encourage you to look to the future with us.

This handbook details the process and timeline for applying for a VCE subject at CHES and there is a simple online written application available through the CHES website: www.ches.vic.edu.au.

I encourage you to read the information in this handbook, on our website, and to contact us with any questions or queries you may have. If you or your family would like to learn more about studying a VCE subject at CHES, we encourage you to attend one of our online information evenings. See our website www.ches.vic.edu.au for registration details. We are also here to provide advice via our school email: centre.higher.education.studies@education.vic.gov.au

We warmly welcome your application to enrol in VCE Extended Investigation or VCE Algorithmics with us in 2023.

Stewart Milner
Foundation Principal
CHES

**We Reach; We Connect; We Understand.
We Think Ahead.**



VCE studies offered at CHES in 2023

The Centre for Higher Education Studies (CHES) offers two VCE subjects for high-achieving and high-ability students in Victorian government schools. These two VCE subjects are highly regarded and typically have great appeal for high-ability students.

VCE Algorithmics Units 3 & 4

Introduction

VCE Algorithmics is a 'Higher Education Scored Study', which means that it is designed to be the equivalent of a first-year university subject. Students can attain a VCE study score for Algorithmics with some universities offering accelerated pathways and credits for successful completion.

Algorithmics provides a structured framework for solving real-world, practical problems with computational methods. It is fundamental to computer science and software engineering and is essential for understanding the technical underpinnings of our information society. Further, it provides a methodical way to approach complex problem-solving in STEM (Science, Technology, Engineering and Mathematics) and other disciplines that benefit from analytical problem-solving and formal reasoning. Computing is central to our society and economy and drives innovation across many fields of human endeavour.

VCE Algorithmics examines how information about the world can be systematically represented and how the processes can be made precise enough to be implemented in a computer program. The focus is not on coding but on 'algorithmic thinking'. Algorithmics covers systematic methods for analysing real-world problems and identifying the key aspects that need to be modelled to find a solution.

Algorithmics also covers deeper topics in computer science such as artificial intelligence, statistical methods of computation, and ethical issues related to these topics. This investigation of theoretical topics is complemented by the development of skills in a high-level programming language.

Structure

The study is made up of two units which must be taken in a sequence:

- Unit 3: Algorithmic problem-solving
- Unit 4: Principles of algorithmics

Prerequisites

There are no Algorithmics Units 1 & 2; there is only the Units 3 & 4 sequence. However, students must be currently enrolled in or have already successfully completed **VCE Mathematical Methods Units 1 and 2** in order to enrol in VCE Algorithmics Unit 3. Students can apply to study Algorithmics in Year 11 or Year 12.

Course content

Unit 3: Algorithmic problem-solving

This unit focuses on how algorithms are used for solving complex problems.

Area of Study 1

students develop and apply a range of knowledge and skills to model real-world information problems.

Area of Study 2

students learn how to design algorithms following a variety of simple algorithm design patterns and learn to graph algorithms.

Area of Study 3

students apply the understanding developed in Areas of Study 1 and 2 to design a solution for a real-world problem that includes both a data representation and algorithm design.

**Unit 4: The principles of algorithms**

This unit focuses on the performance of algorithms and the scope and limitations of algorithms.

Area of Study 1

students study the efficiency of algorithms and techniques for the formal analysis of algorithms and learn to apply these techniques.

Area of Study 2

students learn about a variety of more sophisticated algorithm design patterns and apply their knowledge of these to construct an improved solution for the problem solved in Unit 3.

Area of Study 3

students learn about modern data-driven computation and the existence of hard limits of computability.

Pathways

VCE Algorithmics provides students with an understanding of skills necessary to succeed in careers that involve Computer Science and Software Engineering.

Solving real world problems through algorithmics

Through VCE Algorithmics students can explore solutions to a range of real-world problems, including complex systems and the interactions between variables in those systems. Some examples of these potential real-world applications of algorithms include air traffic control systems, public transport networks, social media algorithms, mobile phone service tower systems, delivery service optimisation, real estate investments, algorithms for artistic effects in photography, the modelling of chemical reactions using algorithms, and much more.

Further information:

<https://www.vcaa.vic.edu.au/curriculum/vce/vce-study-designs/algorithmics/Pages/index.aspx>



VCE Extended Investigation Units 3 & 4

Introduction

VCE Extended Investigation enables students to develop, refine and extend knowledge and skills in independent research and to carry out an investigation that focuses on a rigorous research question. The investigation may be an extension of an area of curriculum already studied or it may be completely independent of any other subject in the student's VCE program.

Through this subject, students develop their capacity to explore, justify and defend their research findings in both oral and written forms to an educated non-specialist audience. Students develop and construct a research question, understand and apply ethical and robust research methods, explore a chosen area of investigation in depth, conduct a review of relevant literature, develop skills in research project management, rigorously analyse and evaluate findings and results, develop skills in written and oral presentation of research findings, and develop as independent, critical and reflective learners.

Aspects of critical thinking such as analysing, evaluating and synthesising information and reasoning logically are integral to the process of formulating and developing an investigation. As well as critiquing the strengths and the weaknesses of the arguments and conclusions of other researchers, students also need to apply critical thinking to their research question, methodology and research findings.

Structure

The study is comprised of a Unit 3 and 4 sequence:

Unit 3: Designing an extended investigation

Unit 4: Presenting an extended investigation

Prerequisites

There are no Extended Investigation Units 1 & 2; there is only the Extended Investigation Units 3 & 4 sequence. There are no prerequisite subjects for studying VCE Extended Investigation Unit 3. Students can apply to study Extended Investigation in Year 11 or Year 12.

Course content

Unit 3: Designing an extended investigation

In this unit students develop skills in question construction and design, explore the nature and purpose of research and research methodologies, critically review research literature, and identify a specific research question.

Area of Study 1

students design and justify a research question.

Area of Study 2

students write a research plan, begin research and present an oral report to an educated non-specialist audience that explains the investigation and justifies the selected research method/s.

Area of Study 3

students develop and apply the skills of critical thinking.

Unit 4: Presenting an extended investigation

This unit is comprised of two parts that together constitute the student's completion of their investigation. The results of the investigation are presented in a final written report and in an oral presentation to an educated non-specialist audience.

Area of Study 1

students complete their investigation and write the final report that provides their response to the research question.

Area of Study 2

students shape their research and findings into a presentation to an educated non-specialist audience and respond to questions and challenges. They reflect critically on the existing research in their field, their own research findings, and research methodology.

Pathways

The skills that students develop in VCE Extended Investigation are essentially transferable to any higher education course because critical thinking and effective research skills are central to university study.

Further information:

<https://www.vcaa.vic.edu.au/curriculum/vce/vce-study-designs/extendedinvestigation/Pages/Index.aspx>



Celebrating the Extended Investigations of students

At CHES, we'll proudly showcase and celebrate the collective learning of students in VCE Extended Investigation each year.

VCE Extended Investigation develops students' understanding of what constitutes a good research question. Some examples of VCE Extended Investigation research questions include:

- How has Japanese cultural identity been portrayed in the American film industry since 2000?
- By looking at diverse, connected communities around the world, such as those of the Yawuru people, the Amish, and the farming communities of north Shaanxi China, what social factors can be observed that contribute to social connections and promote a sense of belonging?
- What is the effectiveness and reliability of a spring pendulum in comparison to a passive pendulum in reduction of side to side (lateral) movement at resonant frequency of a scale-model of the Eureka Tower in Melbourne?
- What is the association between exposure to the medical field and Loddon Mallee VCE mathematics/science students' interest in a medical career?





Application Process

Studying a VCE Subject at CHES in 2023

Our cornerstone belief at CHES is that high-ability students across Victoria can flourish and realise their potential through the opportunities we offer to extend, deepen and accelerate their learning. The CHES VCE subjects are designed to further complement the subjects you will be completing at your current school.

How do I apply to enrol in a VCE subject through CHES?

Students apply via a simple online application form available via the CHES website: www.ches.vic.edu.au

The student application includes two parts: one section to be completed by you and your parent/carer and another by your school. Your school Principal will be asked to share some of your academic data, a statement that confirms your suitability for a CHES program and any special or extenuating circumstances. Your application must be **approved by your Principal**.

CHES will consider a range of information when selecting students for its VCE programs including attainment data such as NAPLAN results, performance across a number of studies and VCE achievement data (if relevant). As part of your application you'll be asked to provide a statement that outlines your desire to study at CHES and reflects your interest and suitability for the program.

Students are not required to take an entrance exam to enrol in a VCE subject at CHES.

Are there subject prerequisites?

There are no subject prerequisites for VCE Extended Investigation Units 3 & 4. It is expected that you will possess the capacity or potential to develop critical thinking and independent research skills.

The only prerequisite for VCE Algorithmics Units 3 & 4 is that you must have successfully completed VCE Mathematical Methods Units 1 & 2 or be studying it concurrently whilst you study Algorithmics. It is also expected that you will have the capacity or potential for developing strong problem-solving skills.

For both VCE subjects, you can apply to study them in Year 11 or Year 12.

Are students from non-government schools eligible to apply?

For students to be considered for a CHES program (HES or a VCE subject) current enrolment in a government school is required. Further, where a student may already have a dual enrolment that reaches across the government, catholic or independent school sectors, the student must be undertaking the majority of their studies at the government school. (For example, if a student is currently enrolled in an independent school where the majority of their VCE studies are being completed but is also undertaking a subject through Virtual School Victoria or the Victorian School of Languages, this student would not be considered eligible for participation in a CHES program).

Students must **maintain their enrolment in a Victorian government school** (as their main school) for the duration of their course at CHES. Students who do not maintain their enrolment in a Victorian government school may be ineligible to continue their studies, or payment may be sought to fund their participation. The CHES principal will determine the most suitable approach in such a situation.

Can I apply for both VCE subjects at CHES?

You will not be restricted from participating in more than one CHES subject per year, however, it is not advised. You may apply to enrol in both of the VCE subjects available. If this is the case, you will be able to advise which is your first and second preference. If you are not accepted into your first preference you may be eligible for your second preference providing you meet the selection criteria and there are spaces available.

If I enrol in a VCE subject through CHES, can I also apply to study a HES?

It is not recommended that you study a VCE subject through CHES as well as a Higher Education Study (HES) through CHES **in the same year**. However, we anticipate that many students will choose to study a VCE subject at CHES in **Year 11** and then apply for a Higher Education Study (HES) in **Year 12**. VCE Algorithmics is a Higher Education Scored Study (HESS) so studying that subject in Year 11 will not impact on your capacity to study a Higher Education Study (HES) in Year 12. You can study VCE Algorithmics (HESS) and a Higher Education Study (HES) and have **both subjects** contribute towards the calculation of your final ATAR.

**How will my application be assessed?**

The allocation of student places to our VCE studies will be based on merit with consideration to the principles of excellence and equity. An enrolment committee convened by the CHES Principal will assess each application. There is no limit on the number of applications that can be received, nor the number of students that can be enrolled at CHES, from any one school. Every application will be given equal consideration.

When are CHES classes held?

VCE Algorithmics and VCE Extended Investigation will be taught by CHES teachers. The timetable will be confirmed later this year. It is anticipated that classes will be available both during and outside normal school hours to minimise clashes with your other VCE classes. We are implementing a hybrid and flexible (hy-flex) approach to scheduling and delivery of sessions to accommodate as many high-achieving students as possible from across the State.

What is the time commitment? What are the attendance requirements?

The time requirements for CHES VCE subjects are equivalent to the time allocation for other VCE subjects. It is important to note that for our VCE subjects, you will be required to maintain a minimum of 90% attendance of scheduled classes to gain satisfactory completion of a VCE Unit of Study. You may choose to attend onsite, virtually, or a combination of both. Only approved absences and approved school activities (sports, excursions etc.) will be considered as legitimate absences for meeting the minimum of 90% attendance rule. For students participating virtually, the 90% attendance requirement also applies.

When you are undertaking CHES programs remotely, you'll need to ensure that you have suitable camera and microphone technology so that your teacher can verify your attendance and so that you can engage fully in our classes.

Can I enrol in a CHES subject in Year 9 or 10 or earlier?

CHES VCE courses are designed for senior secondary students (i.e. Year 11 or Year 12 students). Applications to undertake a CHES course from students in Year 10 or below will only be considered for exceptional circumstances on a case-by-case basis.

How can I find out more?

We will hold an online information session for prospective students and families on **Wednesday 13 July** and then again (as a repeat session) on **Monday 18 July 2022**. Please visit our website for more information and to register for updates www.ches.vic.edu.au



Application timeline for VCE subjects at CHES

Key Dates for Enrolment in Algorithmics or Extended Investigation

Date	
Thursday 16 June 2022	Applications open for 2023 VCE subjects
Wednesday 13 July 2022 (6.30pm)	*VCE Information Evening (online) Session 1
Monday 18 July 2022 (6.30pm)	*VCE Information Evening (online) Session 2 (this is a repeat of Session 1)
Wednesday, 31 August (11.59pm) 2022	Applications close for 2023 program (late applications will not be accepted)
By no later than Monday, 31 October 2022	Outcomes of applications emailed to student applicants and their schools. For students who receive an offer of acceptance, CHES will provide the full enrolment pack for studying at CHES in 2023.
Late January 2023 (Date TBC)	Orientation program for all CHES students
Term 1, 2023	VCE classes at CHES commence.

*We will hold information evenings for students and families to find out more about undertaking a VCE subject at CHES on two separate occasions. It is not necessary to attend both information evenings. Registrations for the information evenings will be available through the CHES website. A recording of the information evening will also be available on the CHES website.



Steps to applying for a VCE Study at CHES

1. Choose one of our VCE subjects

There are two subjects available in 2023. In choosing a subject to apply for, we encourage you to consider your strengths, interests and future career aspirations first and foremost. Two key things to keep in mind are:

- The VCE subjects you most enjoy and achieve most highly in
- The prerequisites and any other requirements for enrolment into CHES

2. Discuss with your school and seek their support

The Principal of your school will need to approve your application to study VCE Algorithmics or VCE Extended Investigation through CHES and you will also need your parent/carers support.

3. Apply online through the CHES website

Once you have confirmed that you are eligible and have support to enrol in a VCE subject at CHES, you will need to submit an online application through the CHES website: www.ches.vic.edu.au

To submit an application follow the steps on the CHES enrolment application page. Choose your preferred VCE subject and complete the Student Statement section.

Students will be asked prepare a short response to the following questions as a part of the application:

1. Please outline your motivation to undertake a VCE course through CHES.

You may like to comment on subject availability within your current school and/or what type of experience you expect you will receive in undertaking the subject through CHES. (Word limit: (300 words)

2. *For students applying for VCE Extended Investigation:* Studying at CHES allows students to undertake research connected to an area or topic of particular interest Please provide a description of your area of interest and what you would hope to more fully understand about this area through further research and investigation. Please note that you do not need to commit to undertaking your Extended Investigation on this topic at this time. (Word limit: 500 words)

3. *For students applying for VCE Algorithmics:* Please outline what it is about Algorithmics that appeals to you and what you hope to learn, understand or be able to do, and why, with this knowledge. (Word limit: 500 words)

While preparing your application, you can click the 'Save' button at any time and return to your application later using your ID number and password (automatically generated at the time of registration). Once you have successfully submitted your online application, you'll receive an automatic email confirming receipt of your online application.

As part of the selection process, we will also seek information about your achievements at school, including some of your NAPLAN results (if available) and your school will be asked to provide a statement that confirms your suitability. Once you have completed and submitted your section of the application, a request will automatically be sent to your Principal to have them (or a representative) complete the relevant section of the application. Please note that all completed applications must be received by CHES at **11.59pm on 31 August 2022**. You are encouraged to **confirm that your school has received the application** and will be able to submit this by the deadline.



Questions?

We welcome your enquiries

If you have any questions about studying VCE at CHES, please contact the CHES team on **centre.higher.education.studies@education.vic.gov.au**

The CHES website should be consulted regularly by students, parents and carers and their schools to ensure that they are accessing the most up-to-date information on HES through CHES.

The benefits of studying a VCE subject with CHES

CHES is specialising in the delivery of and VCE Algorithmics and VCE Extended Investigation as well as Higher Education Studies (first year university subjects) for high-achieving senior students across Victoria.

There are many benefits to studying VCE Algorithmics or VCE Extended Investigation with CHES.

Excellent preparation for future university studies

Both VCE Extended Investigation and VCE Algorithmics provide excellent preparation for subsequent university studies, especially in terms of the research, critical thinking and analytical skills developed in those subjects. They also provide a solid grounding for Higher Education Studies in Year 12. It is anticipated that many students enrolled with us in Year 11 for VCE Algorithmics or VCE Extended Investigation will go on to apply for a Higher Education Study through CHES in Year 12.

Student Enrichment Series

At CHES we recognise the importance of supporting students with their transition to university. Together with our university partners, CHES is making available enrichment and extension opportunities to further stretch and challenge senior students through our CHES Student Enrichment Series. A calendar of events will be published to students on a term-by-term basis and will be available to all students who are enrolled in a subject through CHES. Our Student Enrichment Series will include masterclasses, workshops and seminars and is also intended to enrich and extend the critical thinking, creativity, collaboration and communication skills of students.

Excellent preparation for the emerging hybrid and flexible world

While remaining enrolled at their chosen government secondary school, students will be able to undertake a study at CHES as part of their VCE program. To help students fit their CHES subject in with their overall VCE program, we will deliver our VCE programs in hybrid and flexible ways. This way of learning provides an excellent grounding for students in the adaptive ways of working in the kinds of professional organisations they may seek careers with into the future.



This 'hy-flex' approach to teaching and learning means that we will deliver our VCE subjects on site at our state-of-the-art CHES facility and online through our innovative virtual learning environment. Our provision of these two VCE subjects is mediated through the extensive technology installed and embedded within the CHES facility and this will ensure that regardless of whether students are participating on-site or online, they can have an equitable, high-quality learning experience.

Ongoing support and guidance from CHES

We will provide wrap-around support to enable students to be as successful as possible during their journey with CHES. Our teachers and coordinators will liaise closely with the base-schools of students to support their academic progress, wellbeing and engagement, including those who are learning remotely.

Opportunities to make new friends and connections

Students will be learning together with other high-ability students from across Victoria and will have the opportunity to build positive relationships with others and potentially build a strong network before continuing to university after graduating from secondary school.

Access to a range of CHES resources

All students accepted into CHES will be provided access to the CHES Learning Management System (LMS). This will provide students with a common platform for access to curriculum, learning activities, assessment tasks, collaboration spaces, attendance data, news and key information updates, links to services and staff at the CHES and booking options for the Student Enrichment Series.

Adding credentials to your CV

Students enrolled in a VCE subject with us will have the opportunity to receive achievement awards through CHES, as well as student leadership opportunities including nomination for election to the CHES school council.

Inaugural programs with the new Centre for Higher Education Studies (CHES)

Being part of the first group of students accepted into the new Centre for Higher Education Studies will confer its own rewards for students, including recognition and celebration of the achievements of students at the state-wide CHES hub for VCE Extended Investigation and VCE Algorithmics. This includes a collective showcase of learning and graduation ceremony for CHES students in December 2023.

Student educational resources

Students will be advised if they need to acquire VCE study textbooks (paper or digital versions), stationery, calculators, and digital devices.

Teaching and Learning Framework

At CHES we aim to extend, accelerate and deepen learning.

We aim to challenge and support high-ability students by:

- accelerating access to subjects in the senior secondary years;
- deepening learning through personalisation— including empowering students to independently explore and research topics of interest;
- expanding access to the benefits of **VCE Extended Investigation** and **VCE Algorithmics** to enable deeper learning and exploration of important topics and strengthen the capacity of students to solve complex problems;
- making **Higher Education Studies** accessible to students across Victoria.

Through our programs, we provide opportunities for students to develop these important life-long capabilities:

- **Learning skills:** critical thinking, creativity, collaboration, communication
- **Literacy skills:** information, media, technology
- **Life skills:** flexibility, leadership, initiative, productivity, social skills



The teaching and learning framework at CHES is based on the High Impact Teaching Strategies (HITS), the Victorian Teaching & Learning Model, and the principles of hy-flex instruction and delivery.

Assessment and Reporting at CHES

For VCE Extended Investigation Units 3 & 4 and VCE Algorithmics Units 3 & 4, students will complete a range of learning activities and assessments, including School-Assessed Coursework (SACs), School-Assessed Tasks (SATs), Externally-Assessed Tasks (EATs) and external examination.

Individual Achievement Plans

The study arrangements of each CHES student are considered and agreed between the student, parent/carer, base school, and CHES upon enrolment and induction. Once enrolled in a VCE subject with CHES we will strive to know each student through the establishment of an Individual Achievement Plan to support a successful transition, and this includes:

- timetable schedule
- study arrangements (CHES program and delivery mode: face to face, virtual, or combination)
- travel arrangements (if applicable)
- agreed communication methods between student, base-school, and CHES (who, what, when and how)
- reasonable adjustments to meet the learning and wellbeing needs of students
- student health care needs including asthma management, administration of medication and individual anaphylaxis management.

Progress Reports

Students and parents/carers will be provided with access to an online Progress Report in Term 1 and in Term 3. These reports will provide feedback on a student's learning performance for their VCE subject at CHES in terms of effective learning skills and study habits.

Parent-Student-Teacher(PST) Conferences:

Students and parents/carers will have the opportunity to attend an online PST Conferences in Term 1 and in Term 3 for their VCE subject with CHES. These conferences will take place after the progress reports have been provided to students and parents/carers.

Semester Reports

As VCE Extended Investigation and VCE Algorithmics are Unit 3/4 subjects, CHES will provide a Semester 1 Report and VCAA will provide a Statement of Results at the end of the school year. School-issued reports will provide feedback on the learning performance in terms of the following:

- Unit of Study Result (S or N)
- Outcome Results (S or N)
- Learning and study habits
- Percentage score and teacher comments for SACs and/or SATs.

We warmly welcome your application to enrol in VCE Extended Investigation or VCE Algorithmics in 2023.

For further advice please visit the school website www.ches.vic.edu.au or contact CHES via email: centre.higher.education.studies@education.vic.gov.au