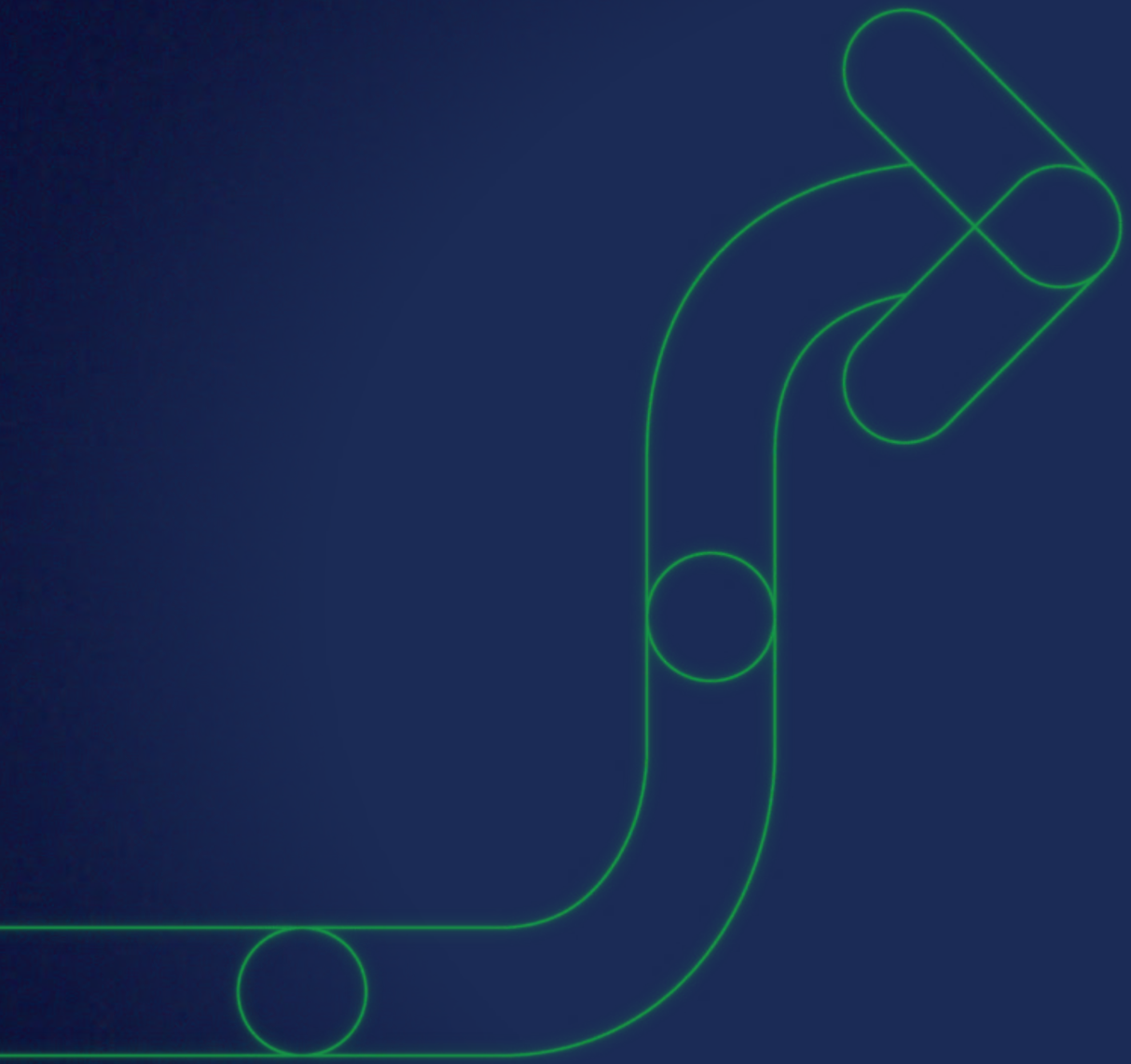
# Geelong Tech School

## 2024 Program Guide

the Gordon

THE EDUCATION STATE

VICTORIA State Government | Department of Education



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**Geelong Tech School** collaborates with schools and industry to prepare secondary students for the future. The programs are fully funded by the Department of Education at no cost to partner schools. We bring together the 'worlds' of work (industry) and study (Victorian Curriculum) with hands on learning programs that are grounded in design thinking and real world scenarios.

Partner school students gain a better understanding of diverse industries, local and global issues and transferable skills that will be essential in a rapidly changing future of work places.

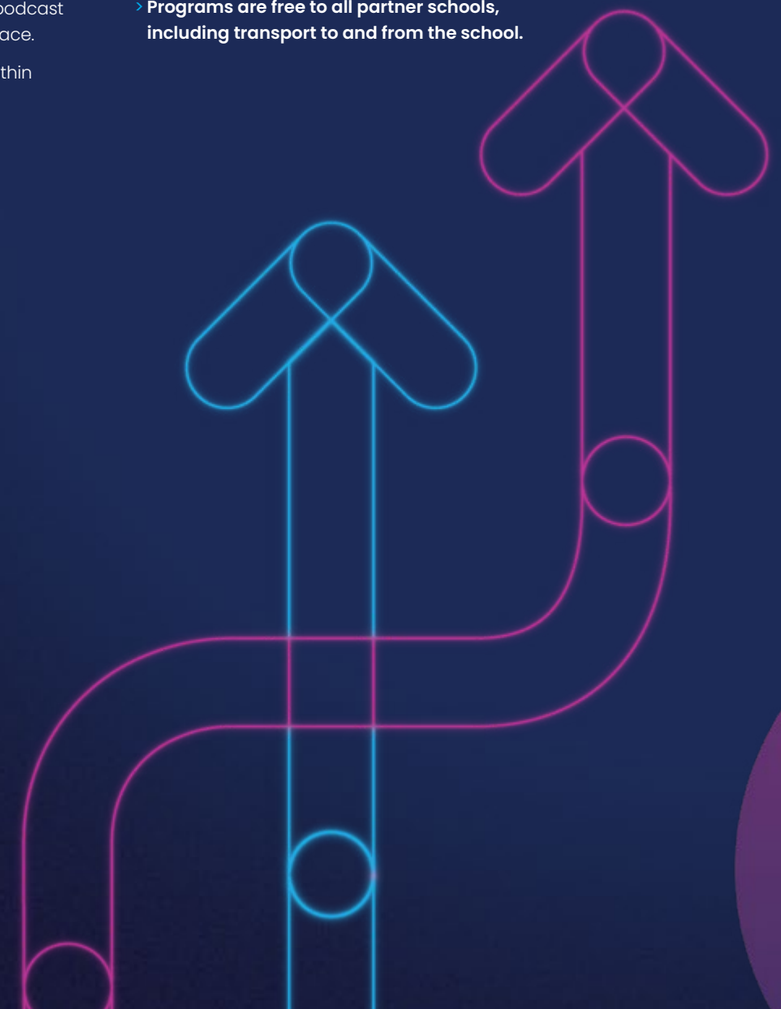
The Geelong Tech School houses a broad range of expertise and technologies including 3D design, 3D printers, 2D design, laser cutters, electronics, robotics, virtual reality, motion capture, a podcast studio and a fully equipped fabrication space.

We are committed to building capacity within local schools through;

- Teacher professional development
- Delivery of high quality, innovative educational programs
- Supporting teachers to achieve STEM curriculum outcomes
- Access to emerging technologies
- Connecting schools to industry and community

## How we work

- Programs are designed to engage and inspire students and teachers.
- We provide and maintain a state of the art learning environment and technology hub.
- Our facilitators have specialised expertise and are passionate educators.
- We provide an extensive suite of resources online as well as support for programs.
- We foster ongoing relationships with local industry ensuring relevant skill development and real world application.
- Technologies, equipment and learning spaces are regularly upgraded through access to an annual equipment renewal fund.
- **Programs are free to all partner schools, including transport to and from the school.**





# Strategic Direction 2022-25

## Our Mission

Geelong Tech School will drive change through innovative program delivery, creating connections, and building a shared responsibility so young people can understand and pursue skills that open up new pathways and opportunities.

## Our Objectives

**Young people taking on their futures.** Through projects requiring design, creativity and the use of innovative technologies.

**To drive change in education,** creating meaningful connections between schools, industry and the community.

**Progress the business model**

## Our Intentions

- Establish purposeful connections that provide opportunities for young people, schools, industry and community.
- Ensure the Geelong Tech School leadership and workforce is equipped to create and drive change.
- Design and deliver applied learning programs and activities that encourage young people to step up, create, contribute, explore new possibilities and take ownership.
- Lead/mentor to drive change creating new practices and building capability that align to future needs.
- Optimise operational performance through resource allocation and business systems.

## Vision for the future

**Geelong Tech School is a network builder** in the STEM education system.

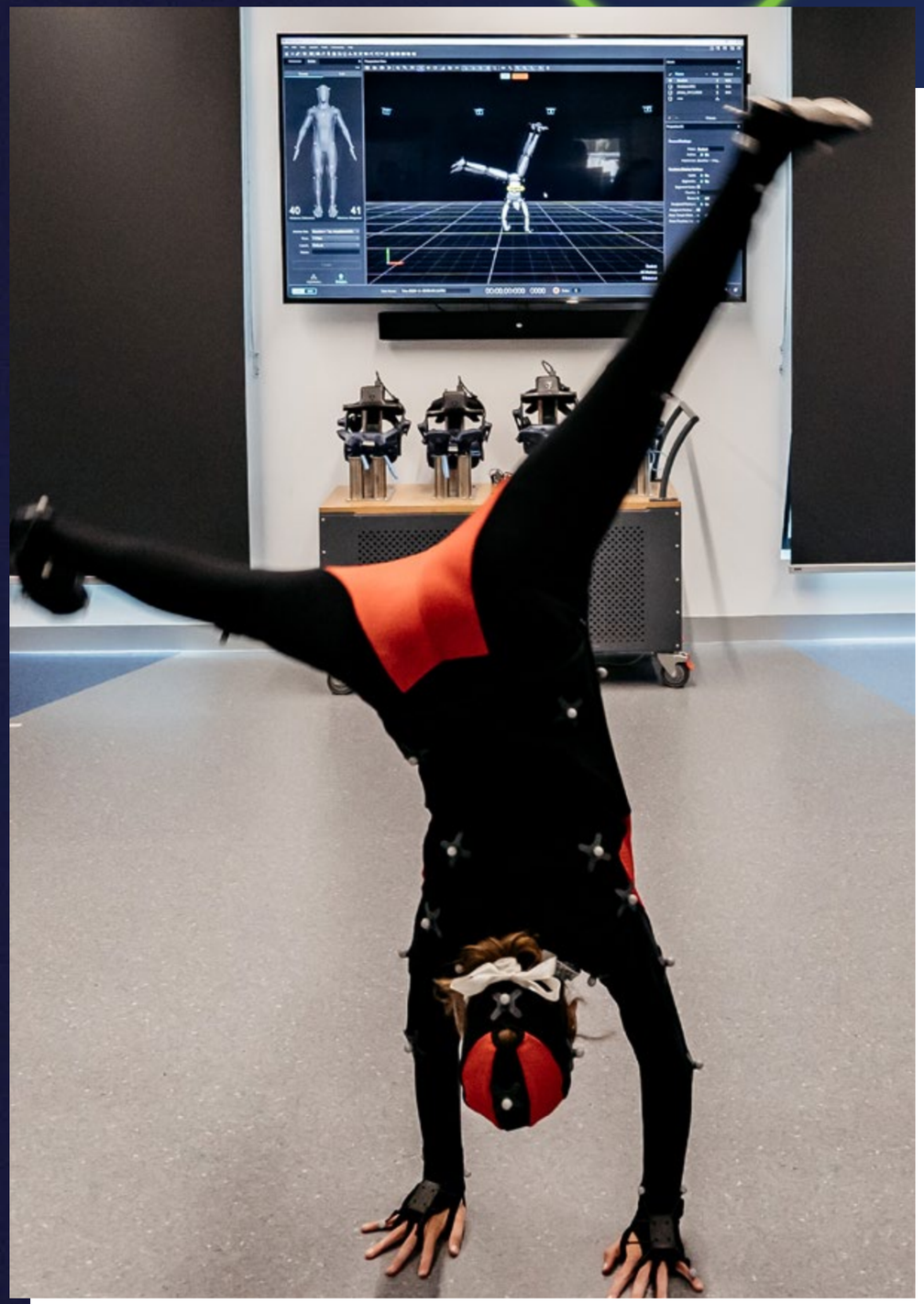
**Students assume a more influential role** in the design of programs, identifying the capabilities they want to build, problems they want to solve and dreams for the future.

**Geelong Tech School leads conversations** stimulates thinking about the future. We will be a skilled disruptor who models educational transformation.

**Young people practise skills that are highly valued** and develop capabilities to exercise choice in future pathways, leading to a sense of meaning, well-being and happiness.

**Learning is a fun endeavour**, that is engaging and rewarding, building hands on skills for life.

**A focus on collaboration** encouraging new connections for young people to pursue their own learning through a variety of Opt-in Programs made available during outside school hours.



Capturing the movement in our MoCap room

# Tech Tasters

Suitable for **Years 7-10 + VM, VCE**
Duration **Full day**

**Tech Tasters provide teachers and students with a one day Tech design sprint inspiring them through the use of technologies & practical hands-on experience.**

They promote advanced technological solutions across a range of possibilities and applications in education. They are facilitated by Tech School staff with teacher support at the Tech School.

Our range of one day 'Taster' Programs are designed to:

- Inspire students to connect learning to future opportunities.
- Develop skills in design and technology through participating in an activity/challenge.
- Familiarise schools with the Geelong Tech School facility.
- Promote the importance of STEM for future work opportunities.
- Develop capabilities in collaboration, team work, problem solving and critical and creative thinking.

## Program Structure

**App, App & Away** UI & UX design and prototyping

**CAD It** 3D design process, CAD, 3D printing & finishing

**Code Breaker A** IDE and text based programming

**Code Breaker B** IDE and text based programming

**Game Design** Develop, plan and create a level

**Laser Make** 2D design in illustrator, laser cutting

**Real Life Animated** MoCap, design & animate

**spARk** Draw, animate, augment

**Street Art X** Create projection artwork

**Table Maze** Electronics, coding & illustrator

**Tinker Time** Electronics, design & coding

## Coming soon

**Cyber Heist** Network and security

**The Tech Tasters were a highlight for our students and I know of several students for whom this ignited interest, whilst for others it provided a great opportunity to learn a new skill or piece of software.**

Year 9 Teacher **The Geelong College**

# Tech Tasters

Suitable for **Years 7-10 + VM, VCE**
Duration **Full day**

## App, app and away

Students will select a design brief and will be provided graphic assets to develop a mobile phone app. Using the design process, students will sketch their ideas before delving into the world of Figma, an industry standard web development tool, to create a working prototype on a mobile device.

### Program Outline

- Introduction to Figma
- Introduction to UI and UX design principles
- Create mobile prototype

### Outcomes

Students will:

- Use Figma to design and prototype an app
- Create a minimum of 5 unique screens
- Test their prototype on a mobile device

### Victorian Curriculum Links

- Design and Technologies
- Digital Technologies
- Visual Communication Design

## CAD It

Design your own product using 3D CAD software and print it on a 3D printer. We introduce students to industry-standard software for Computer-Aided Design (CAD) and 3D printing. Students also engage in a hands-on measurement and dimensioned drawing workshop.

### Program Outline

- Introduction to Computer-Aided Design (CAD) & Autodesk Fusion 360 software
- Design and manufacture a 3D model
- Introduction to 3D printing
- CAD challenges: measuring, drafting, and modelling

### Outcomes

Students will:

- Gain an understanding of CAD and rapid prototyping
- Learn measurement and drafting skills used in CAD
- Develop skills in 3D printing

### Victorian Curriculum Links

- Design and Technologies
- Digital Technologies
- Mathematics
- Systems Engineering

User-friendly Prusa MINI+ 3D Printer

## Game Design

Students will be introduced to Unreal Engine and create an obstacle course themed playable prototype level from provided assets.

### Program Outline

- Explore the Unreal Engine user interface
- Customise assets and materials
- Plan, develop and create an obstacle course style level

### Outcomes

Students will:

- Learn the basics of Unreal Engine
- Create an obstacle course themed level
- Use nodes to customise game play

### Victorian Curriculum Links

- Design and Technologies
- Digital Technologies

## Laser Make

Laser Make starts with a pencil and ends with a laser cutter. Students are given a design brief and work in pairs to create a diorama, as can be seen in the architectural world. Using Adobe Illustrator we take initial drawings and ideas to the computer, using dimensioning and measurement skills where students create assets to be cut by our laser cutter for final assembly.

### Program Outline

- Introduction to design thinking with a hands-on project
- Engaging in drawing, measurement and dimensioning exercises to aid design precision
- Introduction to the CAD program Adobe Illustrator
- Use of a laser cutter to prototype a product

### Outcomes

- Adobe Illustrator skills
- Gain confidence in their technical drawing & measurement skills
- Work collaboratively & foster creativity by meeting a design brief using design thinking
- Ideate a design solution in Adobe Illustrator & create a laser-cut product

### Victorian Curriculum Links

- Design and Technologies
- Digital Technologies
- Mathematics

Obstacle Course created in Unreal Engine by a Year 8 Student from The Geelong College

# Tech Tasters

Suitable for **Years 7-10 + VM, VCE**
Duration **Full day**

## Real Life Animated

Using our industry standard motion capture system students will create and animate a 3D character with their own motion data.

### Program Outline

- Introduction to Motion Capture and how it is used
- Create a 3D character
- Capture motion data in MoCap suit
- Apply motion data to 3D character

### Outcomes

Students will:

- Gain an understanding of Motion Capture
- Collaboratively develop a performance
- Create digital assets in 3D
- Create an animation

### Victorian Curriculum Links

- Art
- Design and Technologies
- Digital Technologies
- Media Arts
- Science

## spARk

Design a cartoon character and bring them to life with animation and augmented reality. Students will learn how to illustrate and animate.

### Program Outline

- Design a cartoon character using illustration techniques
- Bring the character to life by animating its face and body parts
- Load the animation into an Augmented Reality app

### Outcomes

Students will:

- Apply illustration skills to design their own character
- Apply animation skills to bring their character to life
- Use a device to view the character in Augmented Reality

### Victorian Curriculum Links

- Design and Technologies
- Digital Technologies

Capturing movement for application to a 3D character model

## Street Art X

Explore Street Art as an art form, and its punchy position in the artistic landscape.

Students will take a short walk to visit a Mural Projection Space curated by the Geelong City Council. While touring the laneways, students will observe and analyse street artists and their artwork. On their return to the Tech School students will be guided through meeting a creative design brief and designing a projectable artwork in response.

### Program Outline

- Respond and interpret street art
- Respond to a brief
- Create projection artwork
- Use Adobe Capture and Photoshop

### Outcomes

Students will:

- Connect and respond visual artworks
- Interpret artworks by Aboriginal and Torres Strait Islander peoples
- Create digital assets using Adobe software
- Respond to a brief

### Victorian Curriculum Links

- Design and Technologies
- Media Arts
- Visual Arts
- Visual Communication Design

## Tinker Time

Students will use the Hummingbird robotics kit to design and create an automated adventure golf course.

### Program Outline

- Design a miniature golf course
- Prototype the design using cardboard and a range of materials
- Write programs to automate the structure, using sensors to enable lights and motors
- Test and modify the design

### Outcomes

Students will:

- Understand and practice of the design process
- Create a concept design
- Prototype the concept design
- Gain skills in using servos, motors and sensors
- Learn and practice introductory coding

### Victorian Curriculum Links

- Digital Technologies
- Design and Technologies
- Mathematics
- Science

# Tech Tasters

Suitable for **Years 7-10 + VM, VCE**
Duration **Full day**

## Table Maze

Students will design and assemble a table maze and use the Hummingbird robotics kit to create code to solve the maze.

### Program Outline

- Plan and design a maze using Adobe Illustrator
- Construct a maze using cardboard
- Use block coding to automate the maze to solve itself.

### Outcomes

Students will:

- Understand and practice the design process
- Introduction to vector based 2D design
- Introduction to electronics and servo motors
- Construct an automated table maze

### Victorian Curriculum Links

- Digital Technologies
- Design and Technologies
- Mathematics
- Science

Constructing the mini golf course using cardboard

## Code Breaker Series

The Code Breaker Series (Code A & B) develops understanding of microprocessors and their use in everyday life. Using Arduino and other electrical components, students build a series of circuits and execute and annotate text-based code to achieve a variety of different outcomes.

### Program Outline

- Introduction to Arduinos
- Introduction to Ardunio IDE and text based programming
- Introduction to electronic components

### Victorian Curriculum Links

- Design and Technologies
- Digital Technologies
- VCE Systems Engineering

## Code Breaker A

Code Breaker A is aimed at students studying Digital Technologies or Systems Engineering who have had little or no previous experience working with Arduino.

### Outcomes

Students will:

- Learn about Arduino microprocessors.
- Set up circuits including outputs such as LEDs, serial text and servo motors and inputs including push buttons and sensors.
- Learn text-based coding skills and concepts, including writing and calling functions, using arrays, if-else statements and libraries.
- Apply the skills they develop to design and code a solution to a real-world challenge.

## Code Breaker B

Code Breaker B is aimed at students studying Systems Engineering or Digital Technologies who have completed Code Breaker A or have had some previous experience working with Arduino.

### Outcomes

Students will:

- Expand their understanding of Arduino microprocessors.
- Set up circuits including outputs such as Neopixel strips, LEDs and LCD displays and inputs including LDRs and joysticks.
- Develop text-based coding skills and understanding of for loops, map functions, if and if - else statements and I²C communications.
- Apply the skills they develop to design and code a solution to a real-world challenge.

# Core Programs

Suitable for **Years 7-10 + VM**
Duration **5-10 lessons at school & 1-2 days at GTS**

**Core Programs are based on real world scenarios, built on and related to, an industry. Students will be challenged to create solutions using design thinking and technology to achieve curriculum outcomes.**

Our Core Programs are delivered in collaboration with Tech School staff and the teacher. The Geelong Tech School offers professional development for each Core Program, to equip teachers in the delivery of pre and post learning modules and understand the connected learning undertaken at the Tech School. On attendance to the Tech School for the 1 or 2 day excursion, our facilitators will work collaboratively with each teacher during the delivery of the program.

Core Programs are a great example of the Tech School's investment into building confidence and capacity in STEM whereby working with teachers to provide students with a complete learning experience that explicitly links STEM skills and knowledge to student learning. Concurrently assisting teachers as they engage with students regarding career options and impactful subject selection.

## Program Structure

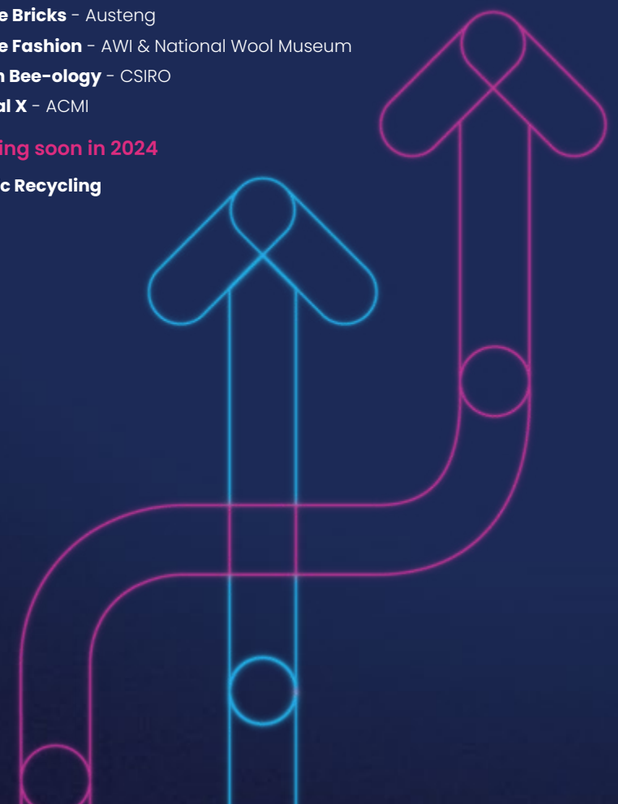
A minimum 4 week commitment is required for a Core Program as it allows time for planning, communication with Tech School staff and classroom delivery. Program resources and documentation are provided via the Tech School learning portal or when attending a PD session. Throughout the delivery of the program we provide ongoing support and access to Tech School resources. The PD and the resources are all offered free of charge.

## Current Core Programs

**Backed Up to the Future** - Barwon Water
**Coasting Drones** - Life Saving Victoria
**Design for Humanity** - Field Ready
**Future Bricks** - Austeng
**Future Fashion** - AWI & National Wool Museum
**Urban Bee-ology** - CSIRO
**Virtual X** - ACMI

## Coming soon in 2024

**Plastic Recycling**







# Backed up to the Future

Suitable for **Years 7-10 + VM**
Duration **4 x 50min lessons and 2 days at GTS**

**Industry partner**

Barwon Water

**Water pipes get blocked and when they do, we either have too little or too much water.**

Barwon Water services many kilometres of pipe to millions of homes and businesses in the Geelong region. The ongoing maintenance, repair and replacement of water pipes is an expensive and time-consuming process.

Barwon Water will engage students to investigate a blocked pipe in their water system. Students will work as a team of 'water consultants' to investigate and find a solution to the problem, using robots.

## Student Outcomes

- Interpret the design brief/challenge
- Investigate reasons for pipe blockages
- Design sewer robots to collect intel and/or clear blockages
- Collate and analyse data

## Main Curriculum Focus

Science, Mathematics, Digital Technologies, Design and Technologies

| Module 1 | Module 2 | Module 3 | Module 4 | Module 5 |
|---|---|---|---|---|
| 2 x 50 min | 1 x 50 min | 1 x 50 min | Full day at GTS | Full day at GTS |
| **Barwon Water & project brief** | **Biodegradability of commonly flushed items** | **Sewer robot** | **Sewer robot: Design & build** | **Sewer robot: Demo & presentation** |
| Introduction to Barwon Water & urban water systems, sewer blockages and maintenance. | Investigate the common causes of sewer blockages & biodegradability of commonly flushed items. | Investigate the different types of sewer robot technology used for sewer maintenance. | Design a sewer robot, including building & coding (block coding), & testing the robot. | Robot testing in a simulated sewer pipe & group presentation of sewer robot prototype. |

**I feel more confident that I can design ways to fix real-life problems**

Year 8 Student **Surf Coast Secondary College**

# Coasting Drones

Suitable for **Years 7–10 + VM**
Duration **4 x 50min lessons and 2 days at GTS**

**Industry partner**

Life Saving Victoria

**Last year 339 people drowned in Australia, with 27% occurring at a beach.**

Nestled amid picturesque beaches and waterways, the captivating Geelong environment offers a unique setting. Explore the innovative potential of drones in collaboration with Life Saving Victoria to enhance beach safety and prevent drownings. Delve into the intricacies of pertinent laws and ethical considerations, culminating in the creation of an Augmented Reality-based information panel dedicated to waterway safety.

## Student Outcomes

- Identify potential safety hazards around waterways
- Understand how drones are currently being used in industry
- Learn the laws and ethics surrounding drone use
- Create an Augmented Reality information panel dedicated to waterway safety

## Main Curriculum Focus

Science, Geography, Digital Technologies, Humanities

### Module 1
1 x 50 min
**Introduction to the project brief**

Introduction to the project, Life Saving Victoria, and to drones used in Industry

### Module 2
1 x 50 min
**Drone ethics & laws**

Learn about the ethics & laws around drone use, and develop a flight plan.

### Module 3
2 x 50 min
@ Partner School
**Safe drone exercise**

Setup a safe flight and spectator zone for a drone demonstration.

### Module 4
Full day at GTS
**Drone rescue mission**

Fly drones & design a device to be dropped from a drone onto a target.

### Module 5
Full day at GTS
**Create augmented reality info panels**

Design & create panels to be displayed in augmented reality.



# Design for Humanity

Suitable for **Years 7–10 + VM**
Duration **10 x 50min lessons and 2 days at GTS**

**Industry partner**

FIELD READY

**Field Ready is a humanitarian engineering organisation that uses rapid prototyping and on the ground design to aid communities in need.**

Students will undertake a challenge modelled on a real world context. They will collaborate in teams to envisage, design and manufacture an engineered solution for a community in need.

The aim is to provide appropriate customised solutions and education to combat local problems and avoid the majority of aid costs by obtaining materials and manufacturing at a local level.

## Student Outcomes

- Interpret the design brief/challenge
- Investigate engineering in a humanitarian context
- Define and document a problem
- Examine and analyse appropriate solutions
- Ideate, brainstorm, define and map a solution proposal
- Gain and extend Computer Aided Design and prototyping skills
- Prototype and test solution

## Main Curriculum Focus

Science, Geography, Mathematics, Digital Technologies, Design and Technologies

### Module 1
1 x 50 min
**The Project Brief**

Learn about design, key principles, the design process & Field Ready's approach.

### Module 2
2 x 50 min
**Appropriate technologies: designing for aid**

Look at appropriate technologies & requirements for designing in resource poor settings.

### Module 3
2 x 50 min
**Problem analysis & definition**

Groups generate structured problem analysis and definitions to respond to aid scenarios.

### Module 4
2 x 50 min
**Ideation & initial concepts**

Teams collaborate in ideation activities create & refine their initial solution concepts.

### Module 5
1 x 50 min
**Metric mapping & analysis**

Teams research their scenario & record design considerations, restrictions & metrics.

### Module 6
2 x 50 min
**Detailed design: prototype preparation**

Teams score & target their initial concept through comparison to research & metric mapping criteria.

### Module 7
Full day at GTS
**Design intensive & prototyping**

Undertake CAD crash course & create their prototype using rapid prototyping technologies.

### Module 8
Full day at GTS
**Prototype assessment & presentation**

Teams test, redesign, refine & assess their prototypes before presenting their solution.

Hemp brick made at partner school ready for testing

# Future Bricks

Suitable for **Years 7–10 + VM**
Duration **6 x 50min lessons and 1 day at GTS**

**Industry partner**

Austeng

**Residential development forecasting predicts that the number of dwellings in the City of Greater Geelong will increase by an average of 2,112 dwellings per annum to 149,346 in 2036.**

Ross George from Austeng, a local engineering company, is investigating hemp bricks as a sustainable alternative to clay bricks. Students will make a brick, test it, gather data and analyse to assess the feasibility of hemp bricks as a commercially viable building product.

## Student Outcomes

- Interpret the design brief
- Investigate conventional bricks and hempcrete
- Design and create hemp bricks
- Carry out testing using credible processes
- Collate and analyse data
- Reflect on processes and results

## Main Curriculum Focus

Science, Mathematics, Digital Technologies, Design and Technologies

| Module 1 | Module 2 | Module 3 | Module 4 | Module 5 |
|---|---|---|---|---|
| 1 x 50 min | 2 x 50 min | 2 x 50 min | Full day at GTS | 1 x 50 min |
| **Populations & Environmental impact** | **Hemp as a construction material** | **Making hemp bricks** | **Testing bricks & data collection** | **Evaluation** |
| Investigation of population growth & the need for sustainable building materials. | Investigate the production of hemp & hempcrete as an alternative building material. | Students work in groups to make their own hempcrete bricks. | Testing the physical properties of hemp bricks in comparison to clay bricks. | Evaluation & interpretation of brick testing data and forming conclusions by critical synthesis of investigations. |

**I got my hands dirty. We made the bricks and then we tested whether it would be a good building material.**

Year 11 student **North Geelong Secondary College**

# Future Fashion

Suitable for **Years 7-10 + VM**
Duration **8 x 50min lessons and 2 days at GTS**

**Industry partners**

awi | THE WOOLMARK COMPANY | national wool museum | CITY OF GREATER GEELONG

**The National Wool Museum and Australian Wool Innovation are calling on local students to design a fashion accessory that incorporates wearable technology with wool as a principal design element.**

Scientific research reveals the many benefits of natural fibres such as wool, as a more sustainable alternative to synthetic fibres.

Students consider the fashion and textile industries in the context of technological progress, such as the major changes in the local wool industry and the advancement of smart apparel.

## Student Outcomes

- Recognise how the fashion and textile industries are advancing with technology and have ethical and sustainability responsibilities.
- Investigate the benefits of wool as sustainable textile.
- Develop skills using Adobe Illustrator and rapid prototyping technologies to create a working prototype
- Understand how technology can be integrated into a fashion accessory.
- Experience and reflect on the design thinking process.

## Main Curriculum Focus

Design and Technologies, Science, The Arts, Humanities

### Module 1
**2 x 50 min**

**Textile industry & sustainability**

Exploring fashion & textile industries, including the sustainability of natural fibres.

### Module 2
**2 x 50 min**

**Introduction to wearable technology**

Student learn to read & adapt code to meet a purpose.

### Module 3
**2 x 50 min**

**Project brief & design thinking process**

Students work to meet the Project Brief from AWI & the National Wool Museum.

### Module 4
**Full day at GTS**

**Wearable technology & prototyping**

Students investigate & utilise code which could be used in their accessory & start prototyping their designs.

### Module 5
**Full day at GTS**

**2D design, laser cutting & prototyping**

Students finalise laser cutting their accessory & prototyping their designs.

### Module 6
**2 x 50 min**

**Presenting and reflecting**

Students present their product & reflect on their learnings through the design thinking process.

**I liked working together with my peers to explore new ideas.**

Year 9 Student **Clonard College**

We use a range of ethically and sustainably produced wool

# Urban Bee-ology

Suitable for **Years 7-10 + VM**
Duration **6 x 50min lessons and 2 days at GTS**

**Industry partners**

CITY OF GREATER GEELONG

**Bees are fascinating insects and highly popular for their golden honey and dancing communication. Are they harming the environment, or essential pollinators?**

Research urban bee culture to discover the advantages and disadvantages of cultivating bees in urban environments. Then visit the Tech School where students will learn Twinmotion, a real-time 3D immersion software that produces high-quality images, panoramas, and 360 VR videos. Students will apply investigative techniques and critical thinking to establish a bee-friendly environment in an urban setting.

## Student Outcomes

- Investigate the importance of bees for agriculture
- Study bee anatomy and understand hives
- Analyse urban beekeeping as a solution for food security
- Research and identify areas of the Geelong CBD for potential bee-friendly environments
- Produce high-quality images, panoramas, and 360° VR videos using Twinmotion

## Main Curriculum Focus

Science, Geography, Digital Technologies, Design and Technologies, VSC, Media

**Module 1**
1 x 50 min
**The Urban Bee-ology Project**
Urban bee keeping as a thriving industry

**Module 2**
1 x 50 min
**Bee anatomy**
Explore bee anatomy & roles in the hive

**Module 3**
2 x 50 min
**Bee behaviour**
Investigate the curious behaviour of bees & their role in agriculture

**Module 4**
2 x 50 min
**Bee friendly environments**
Look into the key role bees have in the environment

**Module 5**
Full day at GTS
**Virtual Reality & Twinmotion**
Use digital design process with Twinmotion

**Module 6**
Full day at GTS
**Twinmotion & Production**
Communicate designs by producing images, panoramas & VR video



# Virtual X

Suitable for **Years 7-10 + VM**
Duration **7 x 50min lessons and 2 days at GTS**

**Industry partner**

acmi

**Museums inspire us through interpretation, empathy and innovative design – skills and abilities in high demand in today's world.**

Imagine using design and art practices in an exciting virtual exhibition. Through addressing a design brief pitched by the Australian Centre for the Moving Image (ACMI) students will conceptualise, design and create a virtual exhibit to be included in a public exhibition. Students will develop art practice using 3D modelling, prototyping and VR design as well as experience project submission processes managed through ACMI. For those students interested in digital design for VCE, this program provides insight into what could be incorporated in a folio.

## Student Outcomes

- Learn creative design and art skills in a VR setting
- Undertake and work collaboratively to meet a design brief managed through ACMI
- Develop key skills in VR creative design using Tilt Brush
- Undertake exhibition submission process managed through ACMI
- Present in an exhibition either online or at Geelong Tech School

## Main Curriculum Focus

The Arts, Visual Communication, Digital Technologies, Design and Technologies, Science, Media

**Module 1**
1 x 50 min
**ACMI & Tilt Brush**
Introduce ACMI and Virtual Exhibition design brief.

**Module 2**
1 x 50 min
**Introduce Design Brief**
Introduce Tilt Brush and apply Design Thinking to develop 3D VR design.

**Module 3**
1 x 50 min
**Research & Artist Analysis**
Research Tilt Brush artists and explore 3D model with concept drawings.

**Module 4**
2 x 50 min
**Prototype building 3D modeling**
Create 3D prototype and reflect on the design brief.

**Module 5**
2 x 50 min
**Present & communicate**
Present 3D prototype to test and refine for creating in Tilt Brush.

**Module 6**
Full day at GTS
**Tilt Brush 3D design**
Learn technical aspects of Tilt Brush and create using VR technology and a VR environment.

**Module 7**
Full day at GTS
**ACMI exhibition artwork**
Finalise design & submit to ACMI for 3D Virtual Exhibition.

# Design to Thrive

Suitable for **Years 7-10 + VM**
Duration **4 days on location and GTS**

**A fully immersive 4-day Design Thinking program** that allows students to work on-site with an industry partner to carry out applied learning in a workplace context to develop their understanding and empathy for the industry's needs. Students explore a range of technologies while working through the design process to address challenges faced by the industry, culminating in the students presenting their outcomes back to industry for feedback.

## Current Programs

**Conservation and Culture**
Parks Victoria

**Agri Tech**
Common Ground Project & Boomaroo Nurseries





# Conservation & Culture

Suitable for **Years 7-10 + VM**
Duration **4 days on location and GTS**

**Industry partner**

Parks VICTORIA

**Work with Parks Victoria to create a solution for real-world problems in conservation and environmental science.**

A fully immersive 4-day Design Thinking program in collaboration with Parks Victoria. Students explore a range of technologies and participate in industry visits while working through the design process to address challenges linked to the industry culminating in students presenting their outcomes.

## Student Outcomes

- Understanding of a work environment
- Empathise with industry challenges
- Respond to a design brief
- Ideate, brainstorm and define problems
- Analyse appropriate options and map a solution proposal
- Develop a range of technology and prototyping skills
- Prototype and test solution
- Pitch to Parks Victoria staff

## Main Curriculum Focus

Science, Humanities, Digital Technologies, Design & Technologies, Work Ready Skills, Capabilities including Problem Solving, Critical and Creative Thinking, Collaboration & Communication Skills

| Day 1 | Day 2 | Day 3 | Day 4 |
|---|---|---|---|
| **Empathise**<br>**You Yangs Regional Park** | **Empathise**<br>**Serendip Reserve** | **Design \| Build**<br>**Geelong Tech School** | **Present**<br>**Geelong Tech School** |
| Participate in sessions with Parks Victoria Rangers to understand challenges within the reserve. | Discover the design thinking process, the project brief and challenges within the sanctuary. | Work through the design process, identify a challenge, design a solution and begin prototyping. Use a range of emerging technologies to prototype designs. | Finalise prototypes and present them to Parks Victoria staff via Zoom. |

**After my Tech School experience, I feel confident I can design ways to fix real-life problems**

Year 11, VM student **Western Heights College**

Reece from STRUT installing a weather station for use at Common Ground Project

# AgriTech

Suitable for **Years 7–10 + VM**
Duration **4 days on location and GTS**

**Industry partner**

COMMON GROUND project

BOOMAROO NURSERIES

**Work with Common Ground Project and Boomaroo Nurseries to create a solution for real-world problems in the agricultural sector.**

A fully immersive 4-day Design Thinking program in collaboration with Common Ground Project and Boomaroo Nurseries. Students participate in industry visits that provide different approaches to the future of food production and explore a range of technology options while working through the design process to address challenges linked to the industry culminating in students presenting their outcomes back to Common Ground and Boomaroo.

## Student Outcomes

- Understanding of a work environment
- Empathise with industry challenges
- Respond to a design brief
- Ideate, brainstorm and define problems
- Analyse appropriate options and map a solution proposal
- Develop a range of technology and prototyping skills
- Prototype and test solution
- Pitch to available Common Ground and Boomaroo staff

## Main Curriculum Focus

Science, Humanities, Digital Technologies, Design & Technologies, Work Ready Skills, Capabilities including Problem Solving, Critical and Creative Thinking, Collaboration & Communication Skills

### Day 1

**Empathise**

**Common Ground Project**

Participate in sessions with Common Ground staff to understand their mission and the challenges they face as a social enterprise.

### Day 2

**Empathise**

**Boomaroo Nurseries & Geelong Tech School**

Participate in a tour of Boomaroo Nurseries to understand their operational and technological challenges. Return to GTS and discover the Design Thinking Process.

### Day 3

**Design | Build**

**Geelong Tech School**

Work through the design process, identify a challenge, design a solution and begin prototyping. Use a range of emerging technologies to prototype designs.

### Day 4

**Present**

**Geelong Tech School**

Finalise prototypes and present them to available Common Ground and Boomaroo staff.

**Going to the park and seeing what we could possibly do to make something better was really good. And it was great to make something and see it through to the end.**

Year 12, VCAL student **Clonard College**

# Inclusion Programs

Suitable for **All ages & skill levels**
Duration **3 Hours**

**Our Inclusion Programs ensure that all young people** can access emerging technologies and innovative learning strategies through STEM and design thinking regardless of their challenges and abilities. We offer a range of opportunities for students to have fun, build confidence, and be creative collaborators to be future problem solvers. Included in our program model are Inclusion Programs that are 3hrs in duration, with multiple break times, which are ideal for smaller classes and offer flexible learning journeys.

## RoboPet

Design and build a robotic "pet" out of cardboard. Apply the use of Hummingbird robotics kits and block coding to make your pet mobile with lights and moving parts.

## SpheroMaze

Apply critical thinking and design skills to construct and prototype a maze. Then code a sphero robot to make its way from start to the finish.

## CAD Creator

Learn to use CAD software to draw a 3D object, develop spatial awareness and explore 3D printing. Discover the use of rapid prototyping technology in industry.

## Battle Bot

Make and code a robot to exterminate all others and become the Battle Bot champion. Build, code, and drive a robot to compete in a game of robot tag.

## Etch & Cut

Design and manufacture a product using laser cutting machinery. Begin with drafting ideas on paper, progressing to applying the design in Adobe Illustrator finishing off with manufacturing a prototype with the laser cutter.

## VR World

Experience the VR world by engaging in a number of activities and challenges using a variety of Apps. Students will also learn the application of VR in work life.

SpheroMaze in action

# School Incursions

Suitable for **All ages & skill levels**
Duration **1-2 hours delivered on-site at schools**

**We bring the Geelong Tech School to you with our custom-built trailer. The trailer is able to be booked for a week at a time by partner schools. Not only do we deliver programs to students, but we can run Professional Development for teaching staff as well.**

## Drones

Students will apply skills in geometry and measurement to fly and code a drone through an obstacle course.

## Virtual Reality

Students will learn how to use Google Tilt Brush and the Oculus Quest VR headset to create their design within a Virtual Reality environment.

## Fast Cars

A multi-lesson program facilitated at Partner Schools, students will participate in making paper vehicles to race on a 20-metre track and analyse their results. This allows reflection on the influential forces on vehicles.

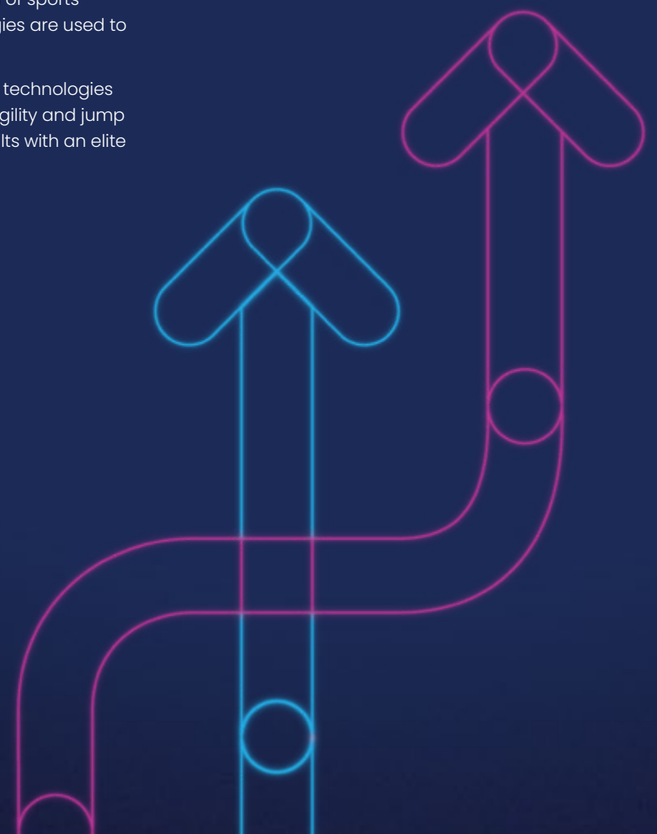
## Fast Physics

A multi-lesson program facilitated at Partner Schools where students explore the physics behind vehicle motion. Newton's Laws are investigated by collecting data on the effect of change in mass on a 3D printed car racing down a track. The program offers physics content as well as modelling of a Scientific Method investigation.

## Sports Science (Coming Semester 2)

Students will understand the world of sports science and how sports technologies are used to improve performance.

Students will use a range of sports technologies to measure speed, acceleration ,agility and jump heights to compare their own results with an elite performer.



# Professional Development

Suitable for
**All primary & secondary teachers**

**The Geelong Tech School as a technology hub, offers a high level of support with access to innovative workshops, expertise and emerging technologies.**

We work closely with schools to increase capacity in STEM and technologies, facilitating collaborative projects to extend teacher capabilities.

Professional Development is offered regularly throughout the year. They aim to extend teaching capabilities and provide a vehicle to achieve outcomes across subject areas. There are a range of PD options in areas related to technologies and curriculum development.

**We commit to:**

- Working with teachers to implement technology into curriculum through access to our programs.
- Supporting teachers to integrate emerging technologies into their classrooms.
- Offer expertise and ongoing access to technology so as to support classroom integration and professional development.
- Providing connections to industry and real world scenarios to create relevancy for integrating emerging technology into classroom learning.

geelongtechschool.vic.edu.au

## 2024 Professional Development Series

### Term 1

| | |
|---|---|
| • **Unleash the power of MicroBits** | Tuesday, 20th February |
| • **Design Thinking for Primary STEM** | Thursday, 7th March |
| • **Tips and Tricks of 3D Printing** | Monday, 18th March |

### Term 2

| | |
|---|---|
| • **Designing practical 3D models** | Tuesday, 7th May |
| • **Transforming the Maths classroom** | Thursday, 23rd May |
| • **Physics in Game design** | Monday, 3rd June |

### Term 3

| | |
|---|---|
| • **Develop compelling video resources** | Tuesday, 6th August |
| • **Product design using laser cutters** | Thursday, 22nd August |
| • **Coding, not just for the nerds** | Monday, 2nd September |

### Term 4

We will be deciding the topics of the Term 4 sessions based on feedback throughout the year.

- **TBD** Tuesday 29th October
- **TBD** Thursday 14th November
- **TBD** Monday 25th November

# Student Opportunities

**Opt-in programs allow students to extend their own learning in an area of interest in their own time.**

Participants apply directly to the Tech School and are responsible for own transport to and from the Tech School.

Participants will;

- Undertake the Design Thinking process
- Access to a range of new and exciting technologies
- Access to Tech School staff expertise
- Be supported with information and ongoing parent communication

## Year 7

### STEM Stars

**Through our online learning portal, students in Year 7 will be able to undertake short courses and gain micro-credentials across all areas of STEM.**

It gives students an opportunity to connect with Geelong Tech School and introduces them to programs and future opportunities.

*This program will be up and running in Semester 2 of 2024.*

## Year 8

### Student Ambassador Program

**1 full day and a 4 week after school program per term.**

**Partner schools annually nominate students from year 8 to participate in the Tech School STEM Ambassador program.**

Tech School STEM Ambassadors will trial new projects and develop new skills using the latest technologies. While students are a part of the Ambassador program they are representing their school and are expected to be leaders of their own learning. Ambassador projects will involve critical and creative thinking, collaboration and communication, to address real world challenges. Design thinking, student agency and leadership development are integral elements to the Ambassador program.

## Year 9 - 10

### Girls in STEM

**Term 1**

At this one-of-a-kind event, young women will discover the boundless opportunities awaiting them in the world of STEM. They will engage in hands-on workshops, interactive experiments, and inspiring talks delivered by accomplished female professionals who have excelled in their respective STEM fields.

### Industry Design Sprints

**Term 2 and 4**

Over 4 days students come in to the Tech School to tackle an issue identified in a local business or industry. The short and intense time frame ensures collaboration, efficiency and thinking on their feet. Ideation, design and rapid prototyping culminate in a presentation of their idea to industry representatives.

### Work Experience

Geelong Tech School provides work experience options. Please contact us for further information about posible times and durations.

**More information about Opt-in programs is available on our website.**

**The design sprint presentations showed what a well-crafted partnership between industry and school can have on authentic learning outcomes for our students... Another positive outcome was the sense of team and clear collaborative skills students would have been required to employ through out the tasks**

Principal **Northern Bay P-12 College**

# Remote & Virtual

Suitable for **All ages & skill levels**
Duration **6 x 90 minute modules**

## Geelong Tech School is offering two innovative programs in 2024.

Our remote and virtual programs are accessible to schools outside the Geelong LGA. The two programs available are 'Introduction to CAD/3D Printing' and 'Electronics'.

The program structure ensures a high level of support for teachers and students to participate in engaging 'hands-on' STEM experiences. Targeting career aspirations and skill development in years 9 and 10 ensures students are empowered to make informed subject choices as they move into the final years of their schooling. Teachers will gain skills, knowledge and ongoing access to expertise elevating the STEM capability in participating schools.

**Each school taking part will have access to:**

- Program specific equipment to compliment the online component of the program.
- Teacher Professional Development, prior to the commencement of the program.
- A student introductory session
- A series of 6 online workshop sessions
- Final online session pulling together skills learnt in a student driven project

### Computer-Aided-Design (CAD)

**Students will:**

- Learn Computer-Aided-Design (CAD) using Autodesk Fusion 360 Software
- Design and manufacture 3D printed products
- Gain an understanding of rapid prototyping
- Prototype and iterate using 3D printers

**Main Curriculum Focus**

Science, Mathematics, Digital Technologies, Design and Technologies

### Electronics

**Students will:**

- Explore devices that send and receive information
- Create using electronic accessories
- Learn and practise introductory coding
- Program micro bits to perform a range of functions

**Main Curriculum Focus**

Science, Mathematics, Digital Technologies, Design and Technologies

**Program overview**

| Module 1 | Module 2 | Module 3 |
|---|---|---|
| In person | In person | Virtual delivery |
| **Equipment drop off/ Set up** | **Teacher professional development** | **6 x Online workshops** |
| Delivery of four 3D printers and electronic kits for a loan period of 6 months. | Two-hour professional development workshop at the school with teaching staff. | Six one-hour modules delivered synchronously or asynchronously supported by a Tech School facilitator. |

Ross George from Austeng at our 2023 Industry Design Sprint.

# Industry & Community

Our industry partners are vital contributors to the Geelong Tech School's programs. Involvement in each of the programs offers real world insights into career paths and makes all of our technologies relevant in an ever-changing world.

## Tour and Information sessions

The Geelong Tech School regularly conducts facility tours for interested industry representatives and community members.

**Please contact**

**Michael Williams** Industry Engagement **mwilliams@gordontafe.edu.au**

**Kellie Andrews** Program Co-Coordinator **kandrews@gordontafe.edu.au**

# Geelong Tech School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