

About the role

Position Title	STEM Tutor & Curriculum Developer – Mechanical
Team	Education & Curriculum Department
Reports to	Programme & Curriculum Lead
Employment Mode	Casual, non-standard hours, work from home options available upon conditions to be discussed. Long term commitment greater than two-years preferred.
Estimated Weekly Commitment	4 to 20 hours
Location	Auckland, New Zealand
Key Responsibilities	1. <u>STEM Curriculum Development</u> Purpose: ◆ Develop the mechanical-related detailed teaching content for tutorials, classes, workshops and other forms of educational sessions in a project-based-learning program. ◆ Put high school knowledge into practice and relate to spacecrafts. ◆ The full combination of the teaching content in this program will lead students to successfully build and test the mechanical aspects of a Cube Satellite. Specific Tasks: ◆ Rapidly learn and digest advance technologies. Including but not limited to satellites and spacecrafts. ◆ Identify specific learning points in NZ high school syllabus and combine them with project-based education milestones. ◆ Create specific teaching plans, teaching content and teaching instructions. ◆ Relating theory to practical applications. ◆ Translate complex concepts into clear text and visual representations to effectively communicate ideas to high school students. Including but not limited to presentation slides, flowcharts, scientific diagrams, graphs and experiment guides. ◆ Design hands-on practical build and experiments to deliver the learning points in real-world scenario. ◆ Performing feasibility analysis of the experiment and practical sessions: ○ Construct equipment list. ○ Source experimental apparatus and record their cost. ○ Perform build, test and result collection of the practical activities to verify their practicality. ○ Perform health and safety assessments.

	◆ Reviewing teaching material: ○ Performing teaching trials and collecting feedback ○ Estimate and adjust timing of the lecture content and practical content. ○ Fact checks the teaching material. ○ Verify theoretical calculations. 2. <u>STEM Tutoring & Instructing</u> Purpose: Teach mechanical-related education content to high school students in a project-based-learning environment. Guide the students to build and test the mechanical structure of a Cube Satellite by the end of the program. Specific Tasks: ◆ Lecture the theoretical STEM content. ◆ Tutor the practical sessions. ◆ Maintaining order during the teaching sessions. ◆ Ensuring the delivery of the learning points. ◆ Communicate and express complex STEM content in a clear and easily understandable manner. ◆ Organize students to perform experiments and build activities. ◆ Support students to build and test the structure of the satellite with both theoretical knowledge and hands-on help. ◆ Answer questions and solve problems with students. ◆ Gather and process feedback information. ◆ Communicate and propose improvements to the overall program and specific teaching content.
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Soft Skill Requirements	◆ Hands-on. ◆ Good time management. ◆ Strong communication skills: ○ Scientific communication or public speaking. ○ Team collaboration. ○ Timely response. ◆ Attention to detail. ◆ Patient. ◆ Proactive. ◆ Independent thinking. Nice to have: ❖ Passionate about space, innovation and education.
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Technical Skills and Requirements	<u>General Requirements</u> ◆ At the end of second year university or above, Master and PhD preferred. ◆ Have a minimum of 1 year experience in tutoring, teaching or other education related roles. ◆ STEM foundation at high school and university level. Able to understand high-level targets in technology driven projects. ◆ Competent in using AI tools such as ChatGPT and Copilot to produce ethical and accurate results and summaries. ◆ Proficient in Microsoft Office software, including PowerPoint, Word, Excel, OneNote, and SharePoint. ◆ Proficient English writing skills. ◆ Flowchart design with logical thinking. ◆ Problem-solving. <u>Mechanical Specific Requirements</u> Theoretical Skill Sets (Core Knowledge) These ensure the tutor can explain, model, and guide students conceptually. 1. Fundamental Mechanics ◆ Statics, dynamics and strength of materials. ◆ Vibration, resonance and acceleration. ◆ Center of mass, Free-body diagrams and load analysis. ◆ Stress, strain, bending, and torsion (basic structural design reasoning) 2. Thermodynamics & Heat Transfer ◆ Basic thermodynamic cycles ◆ Conduction, convection, and radiation 4. Materials Science (Basics) ◆ Basic material selection knowledge around metals, plastics and composites ◆ Thermal expansion, fatigue, and corrosion awareness 5. Engineering Mathematics ◆ Basic applications of vectors, matrices, differential equations 6. Introduction to Aerospace Systems (nice to have) ❖ Understanding what makes up a satellite structure. ❖ Basic understanding about orbital and launch environment. Practical Skill Sets (Hands-On & Applied) These allow the tutor to help students build, test, and troubleshoot real satellite components or demos. 1. CAD and Design ◆ Familiar with at least one CAD software (Bonus for familiar with SolidWorks) ◆ Familiar with CAM software ◆ Understanding of design for manufacturability 4. System Prototyping & Testing
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	◆ Building and testing small assemblies ◆ Writing simple test plans and documenting results clearly ◆ Able to go hands on with 3D printing, laser cutting, design for CNC milling 5. Workshop & Fabrication Skills ◆ Drilling, tapping, cutting, or assembling frames ◆ Safe tool handling and lab awareness ◆ Understanding tolerances.
Additional Employment Benefits and Potential Opportunities	◆ Potential involvement in the design and building of one of our satellites! ◆ Visit laboratories where satellites are designed, built and controlled. ◆ Communicate and network with leading professionals and organizations in the field of astronautic engineering. ◆ Interact and network with local and international suppliers and institutes. ◆ Be a part of the network with highly talented students and staff globally. ◆ Continuous learning opportunities are available through project involvement and mentorship. ◆ Gain insights into global trends in aerospace and the latest advancements in technology across a wide range of disciplines. ◆ Potential conference trip to the USA. ◆ Seeing rocket launch in person or in mission operation control center.

About Us

The Practical Science Laboratory (PSL) is an education organisation dedicated to transforming theoretical knowledge into practical experience. Our mission is simple: true understanding comes from practice. We bridge the gap between classroom learning and real-world application by creating opportunities for students to engage directly with cutting-edge science and technology. Our core capabilities were developed from foundational work in spacecraft mechanics and satellite systems. Founded with the belief that science should be both accessible and actionable, our mission is to cultivate curiosity, critical thinking, and a sense of purpose in future generations.

Working with Us

Working with us offers a unique opportunity to be part of a satellite program. The mission serves educational purposes and makes a real-world impact. You'll gain continuous exposure to the latest developments in engineering research and cutting-edge technology, with insights into active research directions across multiple disciplines. Above all, PSL offers a platform that empowers growth, collaboration, and innovation toward a shared future for humanity.

Recruitment Process

1. Application Submission

- Submit your **CV** and **cover letter** (recommendation letter would strengthen your application).
- Applications will be reviewed based on relevance and suitability.



2. Technical Round

- ◆ Congratulation on passing stage 1 and entering the technical round! This round is designed to assess your ability to apply skill and knowledge in real-world scenarios.
- ◆ You will receive an **information package** outlining a problem or task. You will be assigned a staff contact for clarification or questions during this stage.
- ◆ Let us know when you are ready for the challenge. You will have **one week** to formulate your solution from the day you receive the information package..
- ◆ Present your solution through a **recorded video**, addressing the following points:
 - How did you approach the problem?
 - What is your proposed solution?
 - What improvements could be made upon your solution?



3. Interview Stage

- ◆ Shortlisted candidates will be **invited to an interview**.
- ◆ The interview will include:
 - General interview questions.
 - Discussion of your proposed solution and potential improvements.
 - A short technical question related to the role.
- ◆ This is also an opportunity for you to discuss your interests and goals with us.



4. Conditional Offer

- ◆ Successful applicants will receive a **conditional offer**, subject to:
 - Background check
 - Police vetting
 - Fixed-Term Employment (Trial & Training Period)
- ◆ A **3-month paid trial and training period** will apply for new hires.
- ◆ After successful completion, candidates may be **considered for a long-term role** within the organization.