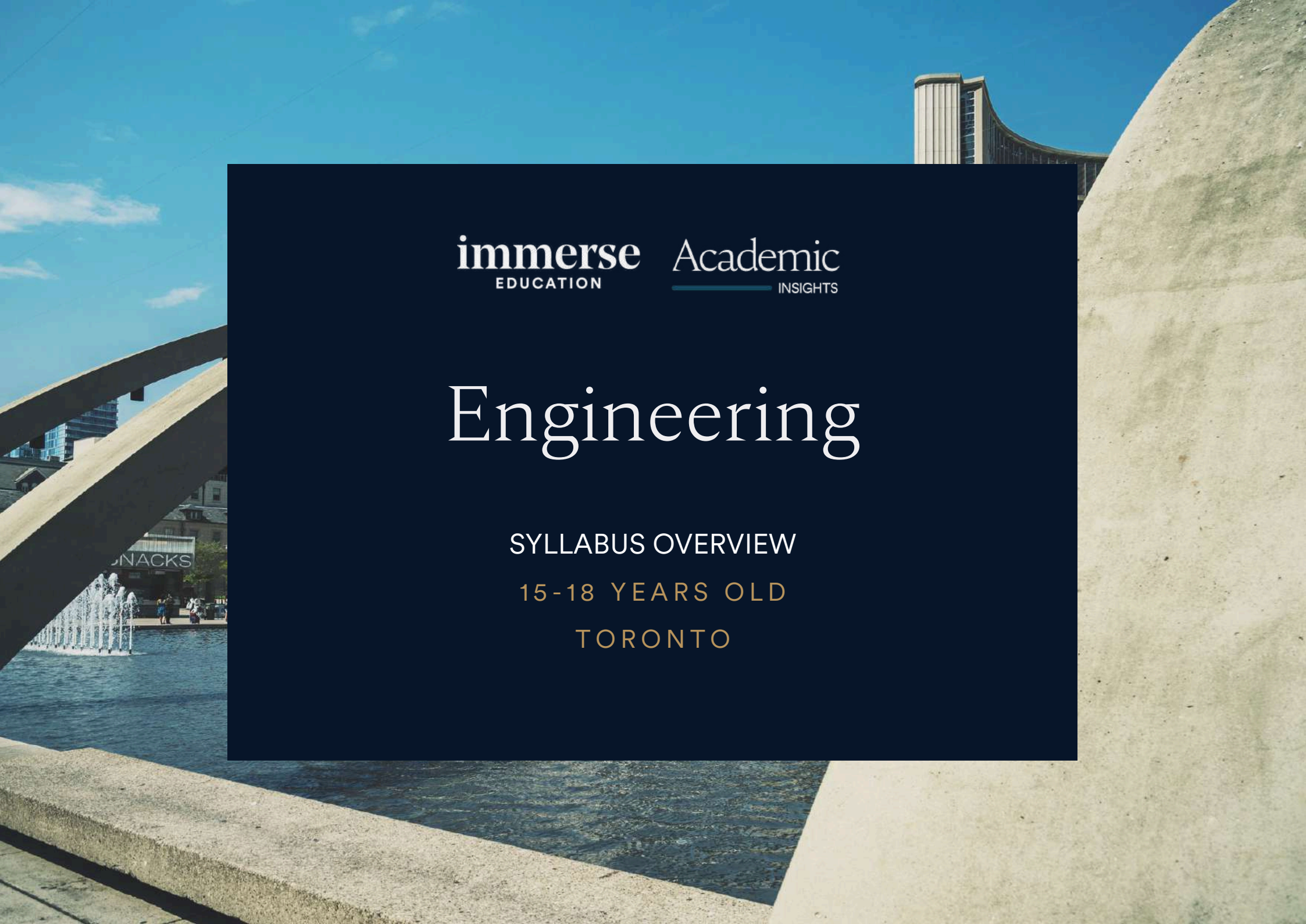

immerse EDUCATION Academic INSIGHTS

Engineering

SYLLABUS OVERVIEW

15-18 YEARS OLD

TORONTO

About the Programme

Immerse Education is an award-winning provider of summer experiences offering academic and career-focused programmes for high school students worldwide, in such locations as Boston, Cambridge, London, New York, Oxford, San Francisco, Singapore, Sydney, Tokyo, and Toronto. Our programmes aim to deliver engaging, academically challenging content within a university-style classroom environment.

The Academic Insights programmes give participants a valuable introduction to studying their chosen subject at an advanced university level, preparing them for future academic success and life at university. During the programme, students experience university-style teaching, explore complex topics, and develop the skills, confidence, and curiosity needed for successful applications and higher-level study.

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Academic Sessions

Sessions during the programme are organised into thematic areas that allow students to explore a broad range of topics in depth. The programme combines two types of sessions: theory-based sessions that introduce advanced concepts similar to university study, and practical-based sessions that encourage students to apply this knowledge to case studies, real-world projects, or research tasks. Topics highlighted in thie guide are indicative and may be adapted by tutors to reflect their academic expertise or participants' interests. This approach helps students develop both subject knowledge and the ability to think critically and independently.

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Preparatory work

Some tutors may ask participants to complete preparatory work before the start of the programme, such as assigned reading, independent pre-research, or a series of short exercises. These tasks help ensure that all students begin the course with a shared foundation of understanding and are ready to engage in higher-level discussion and analysis. Preparatory materials are provided in advance and designed to make students feel more confident, better prepared, and able to get the most out of their academic experience once the programme begins.

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Academic Difficulty

Immerse Education's Academic Insights programmes are designed to introduce students to university-level study and build on necessary skills. The material can be challenging, but tutors provide structured guidance, personalised feedback, and encouragement throughout. Each participant is supported according to their own level and learning goals, ensuring that everyone is able to progress and achieve their potential. This academically stimulating experience is something to look forward to — an opportunity to build confidence, expand knowledge, and develop valuable study skills in a supportive and inspiring environment.

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Academic
INSIGHTS

Aim of the Engineering Programme

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Introduction to Engineering

Engineering connects science, mathematics, and imagination to solve real-world challenges. This programme helps students understand how engineers analyse systems, design sustainable solutions, and apply innovation to improve everyday life. Set in Toronto, a city known for its research and technological development, the course combines academic study with exposure to ideas driving progress in energy, infrastructure, and environmental design. Students will gain a deeper appreciation of how theory, data, and creativity work together in engineering.

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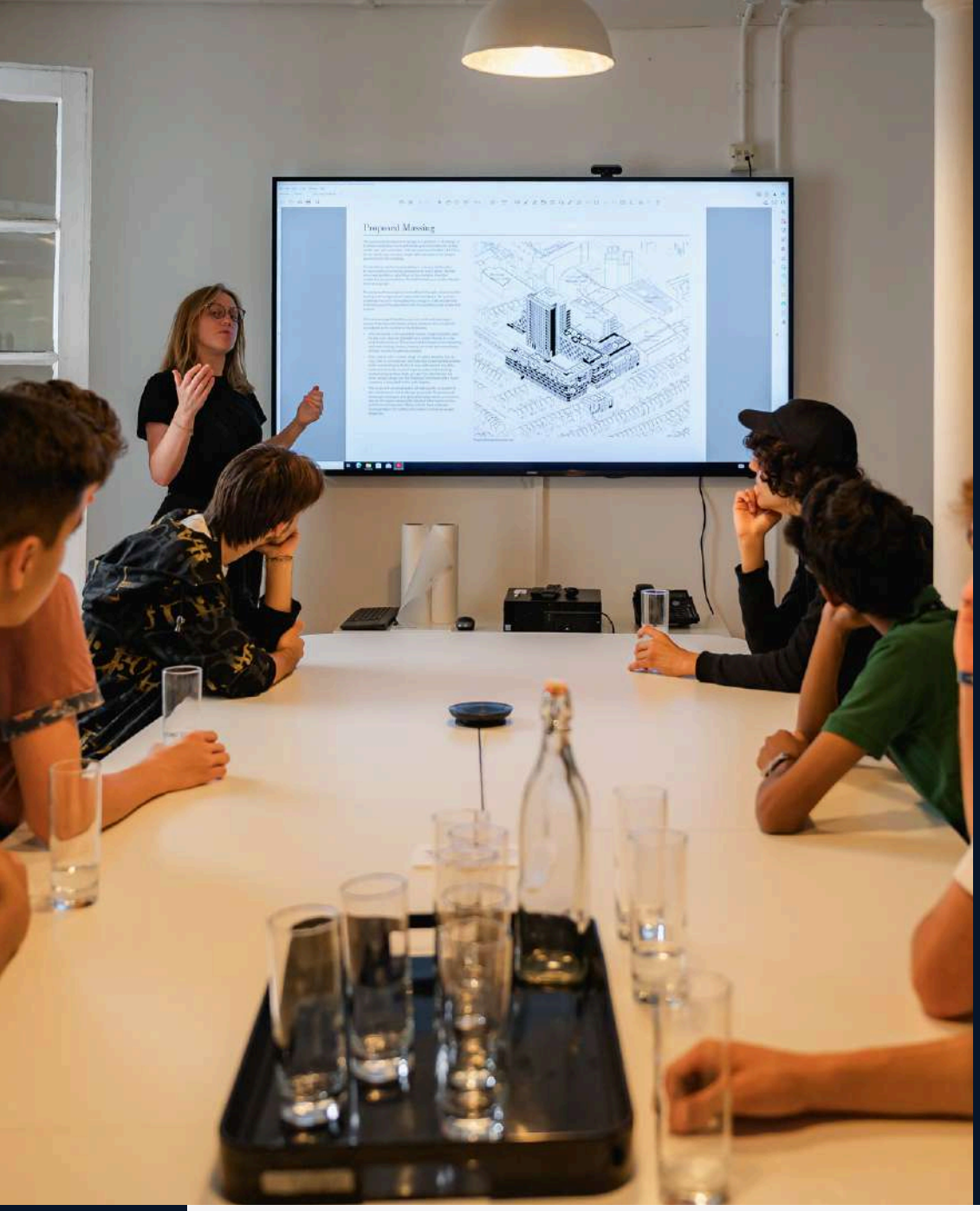

Academic INSIGHTS

Fundamentals of Engineering Design

Learn how engineers apply scientific and mathematical reasoning to design functional systems. You will study the stages of design, from identifying a problem to testing solutions, and analyse how research and creativity combine to produce innovation. Students explore famous engineering projects and evaluate how design choices affect efficiency and sustainability. This topic develops logical thinking and the practical mindset needed for future university study.

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TORONTO | **15-18** | **ACADEMIC INSIGHTS**

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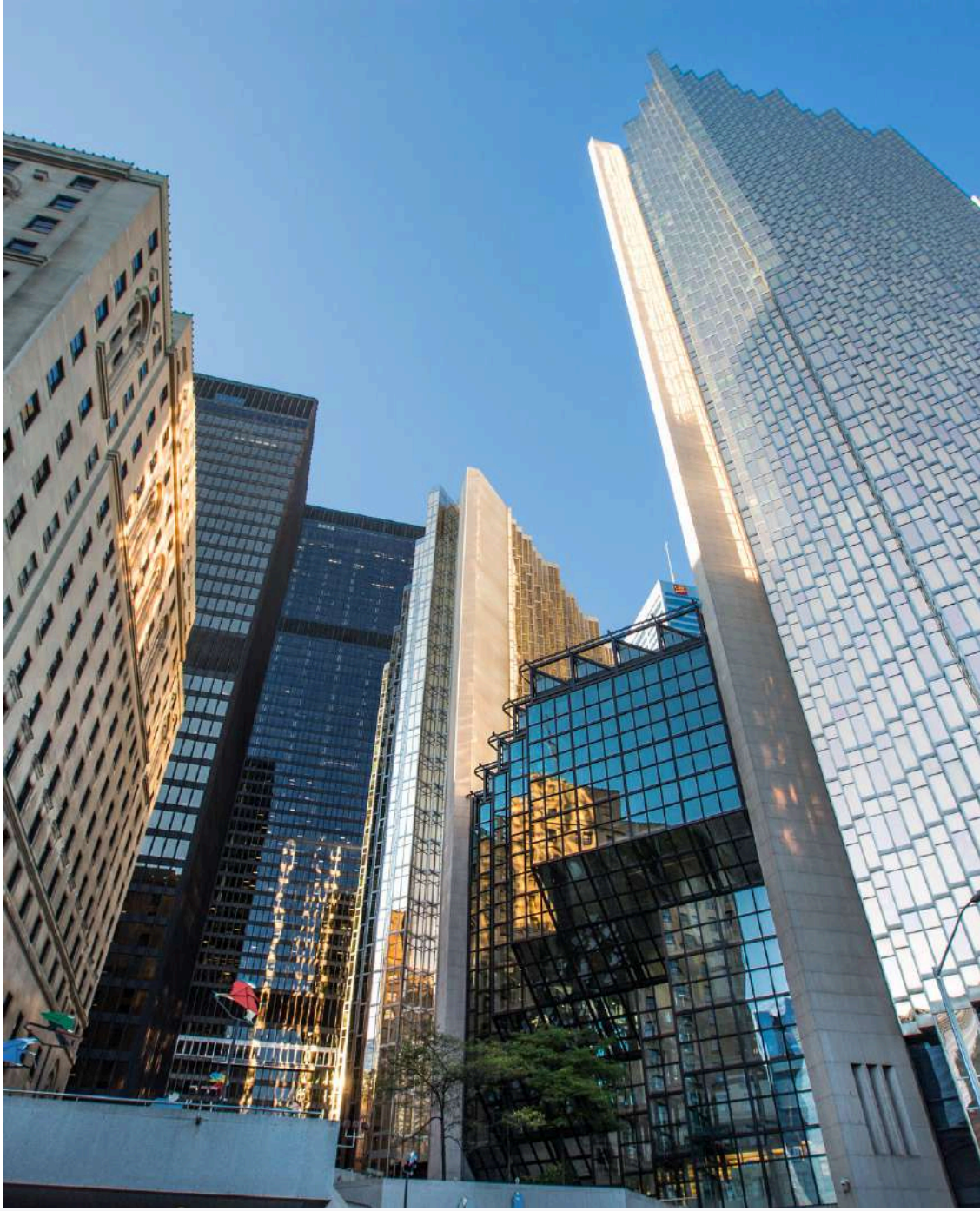
Mechanics and Structural Engineering

Explore how physical principles govern the stability and strength of structures. You will study forces, equilibrium, and material stress, and apply these ideas to bridges, towers, and transportation systems. Students will practise calculating loads and understanding how design geometry affects safety and performance. This topic builds problem-solving skills and provides insight into mechanical and civil engineering foundations.



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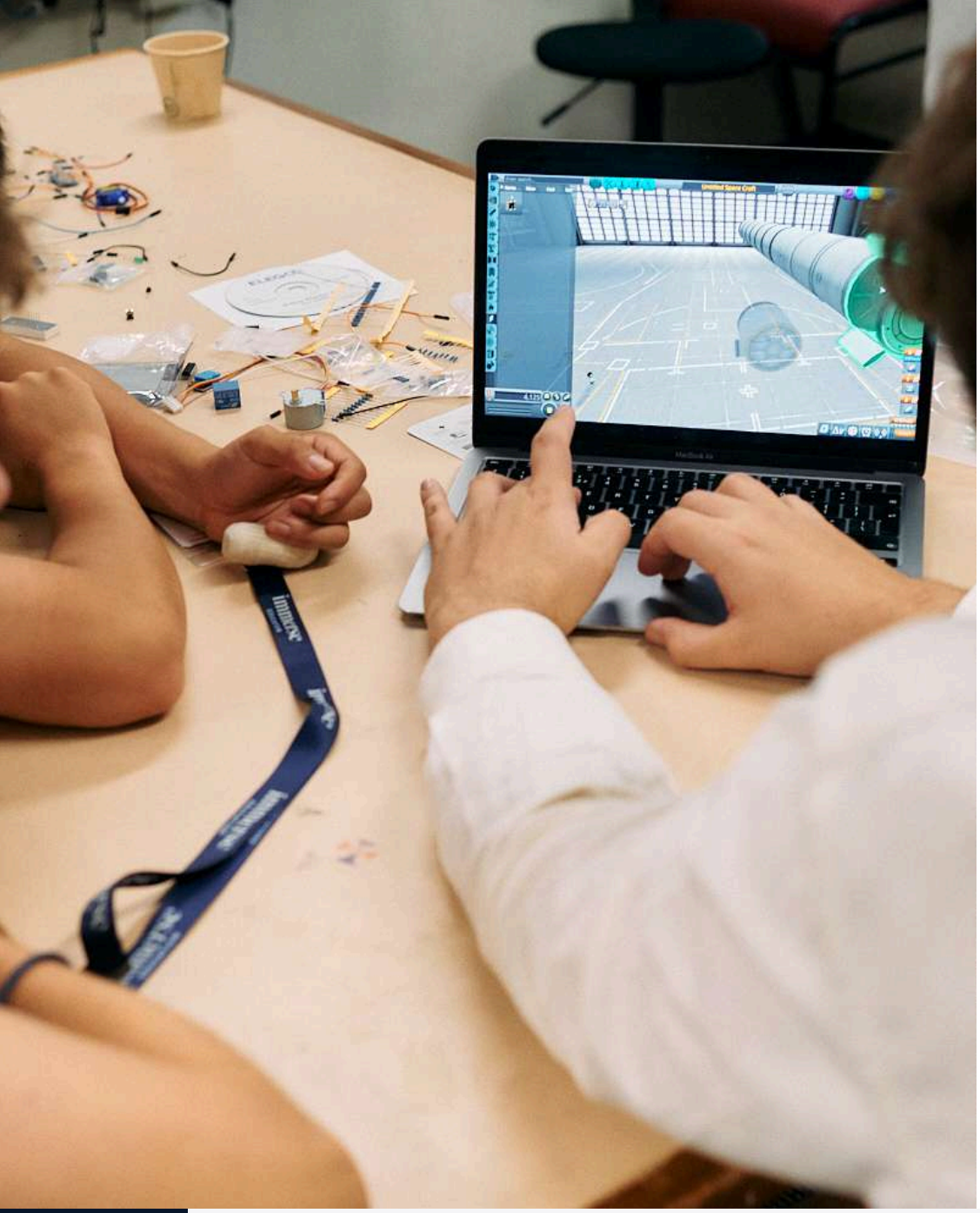

Electrical and Computer Systems

Understand how electricity and computing power the modern world. You will study voltage, current, and resistance, along with the basics of circuit design and automation. Students analyse how electronic systems form the foundation for innovation in robotics, energy, and communication. This topic enhances mathematical reasoning and introduces concepts central to electrical and computer engineering degrees.

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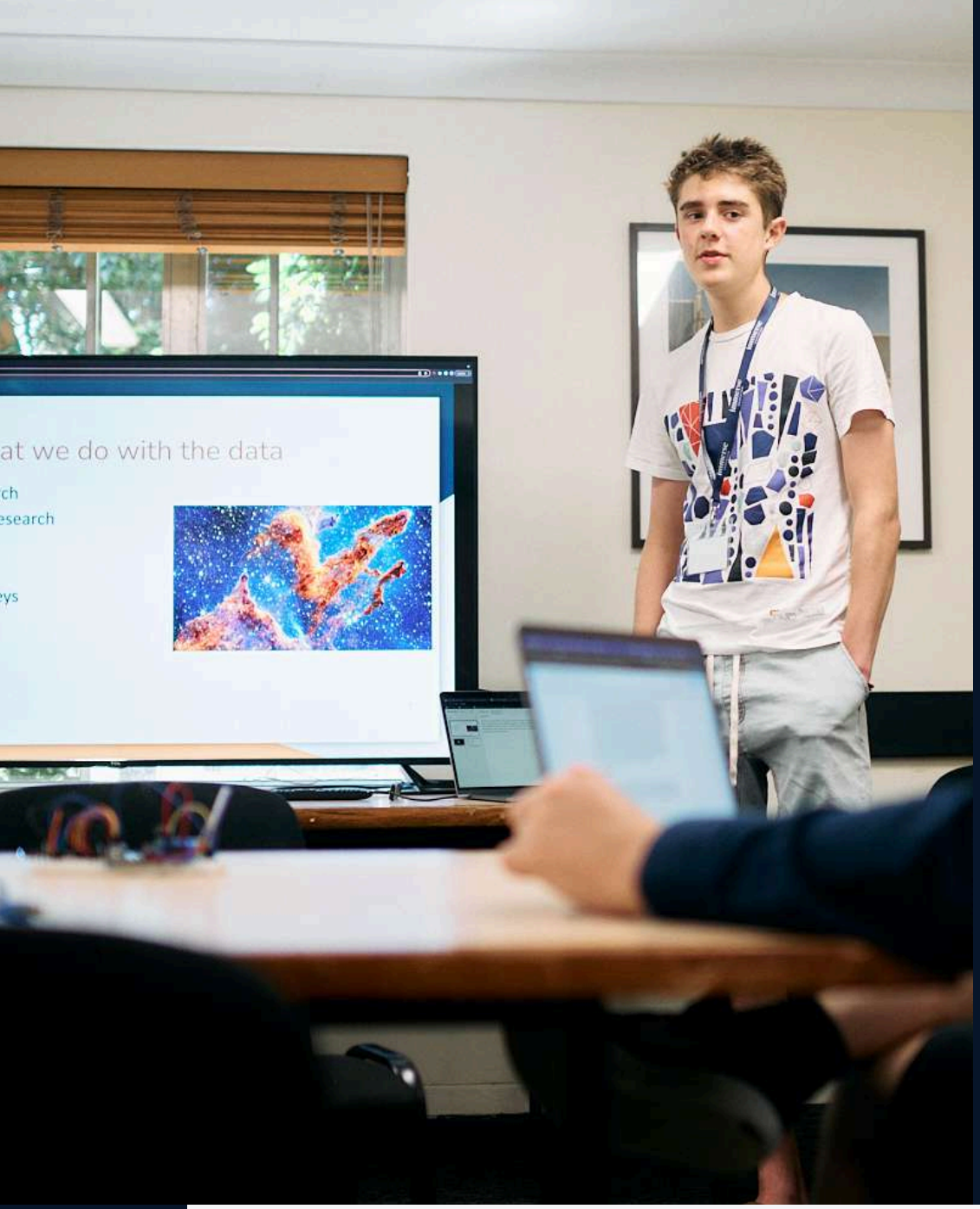

Environmental and Sustainable Engineering

Investigate how engineers address climate change and resource management through sustainable design. You will study renewable energy technologies, green infrastructure, and environmental monitoring systems. Case studies from Canada and beyond show how engineers balance growth with ecological responsibility. This topic encourages critical thinking about global sustainability challenges while strengthening research and analysis skills relevant to environmental and civil engineering.

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TORONTO | **15-18** | **ACADEMIC INSIGHTS**

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Materials Science and Manufacturing

Discover how materials determine the performance and reliability of engineered products. You will explore the properties of metals, polymers, and composites and how they respond to stress, temperature, and environmental change. Through analysis and experimentation, students evaluate how material selection impacts durability, cost, and sustainability. This topic helps develop an understanding of engineering at both micro and macro scales.

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Innovation and Future Technologies

Explore how modern engineering evolves through innovation and collaboration. You will learn about advancements in automation, artificial intelligence, and smart infrastructure, examining their influence on industries and society. Using Toronto's role as a growing technology hub as inspiration, students consider the relationship between innovation, ethics, and sustainability. This topic prepares students to engage critically with emerging technologies shaping the future of engineering.

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Personal Project

Each Academic Insights programme includes an individual project focused on independent research and academic reflection. The Personal Project allows students to explore a specific topic or question in greater depth, applying theoretical knowledge and original thinking. With guidance from their tutor, participants develop their ideas throughout the programme and present their findings at the end. The Personal Project may take the form of essay, presentation, creative piece, or report.

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After Your Programme

By the end of the programme, students gain a solid understanding of their chosen subject and how it is studied at university. They leave with enhanced independent thinking, critical research and analysis, and communication skills, as well as confidence for advanced learning. Each participant receives an individual feedback report from their tutor, highlighting strengths, progress, and personalised recommendations for future study. Students can also use their Personal Project and tutor feedback as part of their university applications or portfolios, showcasing both academic ability and intellectual curiosity.

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