

# Engineering Transfer

We offer the necessary science & math courses to prepare for an engineering program, along with a solid grounding in the Christian liberal arts.

The Faculty of Natural and Applied Sciences offer students with a set of courses which are valuable preparation for completing an engineering degree elsewhere. Students have the option of spending or two years at TWU, completing valuable science and math courses alongside Christian liberal arts courses.

Engineering transfer students receive a solid understanding of the math and science foundations for engineering and learn to become problem solvers. The courses students take combine scientific and mathematical concepts which challenge students to think critically and find practical solutions in their class work and everyday lives.

## WHY CHOOSE OUR PROGRAM?

We have all the necessary **first-year science & math** courses, and even some of the second-year courses, with professors who are **experts**, mostly with PhDs. And unlike at UBC or SFU or UVic or elsewhere, these courses are taught in **small classes** and from a **Christian perspective**.

You can take other **TWU core courses** to provide a solid foundation in the Christian liberal arts: Philosophy, History, Religious Studies, Psychology, Business, Communication, and others.

TWU offers the necessary science & math courses to prepare for an engineering program, along with a solid grounding in the Christian liberal arts.

- Our emphasis on the **liberal arts** includes excellent opportunities for developing students' **communication skills** which are very important in engineering.
- As a Christian university, we have a calling to be **sensitive to cultural, economic, and social impacts** of our work.
- We explore and develop an **interdependent and multi-faceted creation**.
- We have strong biology and environmental studies programs which are in an excellent position to help faculty and students advance the concepts of **sustainable development and environmental stewardship**.
- Our Christian **morals and ethics** contribute to a solid understanding of the roles and **responsibilities** of the engineer.

Engineering is **part of our mandate** to develop and advance culture through wise and stewardly use of the resources entrusted to us by their and our Creator.

The world needs **insightful, servant leadership** by engineers whose motivations and ideals have been formulated through a critical analysis of the positive and negative cultural effects of technology.

Engineers must seek to develop technological artifacts in ways which acknowledge the fact that the users and beneficiaries are **image-bearers** of the Creator.

ID	COURSE	CREDITS
CHEM 111	<b>CHEM 111 - Principles of Chemistry I   2022-2023</b>  This course considers modern concepts in the fundamental laws and principles of chemistry. Investigated topics include: stoichiometry, and chemical calculations, nature of solutions, acids and bases, and oxidation/reduction reactions, the gas laws, thermochemistry, the periodic table, bonding, molecular structure and descriptive inorganic chemistry.	3
CHEM 112	<b>CHEM 112 - Principles of Chemistry II   2022-2023</b>  Modern concepts in the fundamental laws and principles of chemistry: Introduction to chemical kinetics, chemical equilibrium, acids, bases and buffer systems, solubility equilibria, elementary energy concepts, electrochemistry and an introduction to organic chemistry. These concepts are discussed as far as possible in the context of their significance in life processes, in industrial process, and in the environment.	3
CHEM 198	<b>CHEM 198 - Lab for CHEM 103 and CHEM 111   2022-2023</b>  This lab course will compliment either the Chem 103 or Chem 111 lectures. It is meant to give students an opportunity to apply the learning that is happening in class in a hands-on way. The chemical concepts learned in Chem 103 or Chem 111 will be explored (topics include: stoichiometry, the nature of solutions, acids and bases, oxidation/reduction reactions, thermochemistry, the periodic table, bonding, molecular structure and colligative properties). This chemistry lab is also meant to introduce students to lab safety, common lab practices and lab techniques that will be required for upper level science courses and beyond.	1
CHEM 199	<b>CHEM 199 - Lab for CHEM 104 and CHEM 112   2022-2023</b>  This lab course will compliment either the Chem 104 or Chem 112 lectures. It is meant to give students an opportunity to apply the learning that is happening in class in a hands-on way. The chemical concepts learned in Chem 104 or Chem 112 will be explored (topics include: solubility, kinetics, chemical equilibrium, organic synthesis and extraction, buffer chemistry and electrochemistry). This lab involves a special project where students will get to explore, in depth, an area of choice and present that knowledge to the class. This chemistry lab is also meant to introduce students to lab safety, common lab practices and lab techniques that will be required for upper level science courses and beyond	1
CMPT 140	<b>CMPT 140 - Introduction to Computing Science &amp; Programming I   2022-2023</b>  An elementary introduction to computing science and programming as a problem-solving tool. Fundamental concepts and terminology of computing science will be introduced. Programming skill will be obtained by using a high-level language. Topics will include: abstraction, data types and control structures, fundamental algorithms and pseudocode, computability and complexity, and computer architecture.	3
CMPT 166	<b>CMPT 166 - Introduction to Computing Science and Programming II   2022-2023</b>  A rigorous introduction to computing science and computer programming. Students will learn in-	3

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	<p>depth programming concepts by seeing how object oriented (OO) concepts are employed in the design and writing of code in a variety of notations. The emphasis is on the theory of OO programming and design of solutions, as well as implementation using an OO language such as Java or C++.</p>	
MATH 123	<p><b>MATH 123 - Calculus I   2022-2023</b></p> <p>An introduction to the basic elements of calculus and its applications to modeling solutions to quantitative and computational problems encountered in mathematics and science.</p>	3
MATH 124	<p><b>MATH 124 - Calculus II   2022-2023</b></p> <p>Transcendental functions, integration techniques, polar co-ordinates, sequences, series, and Taylor series.</p>	3
PHYS 111	<p><b>PHYS 111 - Fundamentals of Physics I   2022-2023</b></p> <p>Students investigate physical reality employing basic principles of Newtonian mechanics which allow the description and explanation of motion: three-dimensional kinematics, dynamics of particles and rigid bodies including work, energy, momentum, rotational motion, simple harmonic motion, and fluids.</p>	3
PHYS 112	<p><b>PHYS 112 - Fundamentals of Physics II   2022-2023</b></p> <p>The basic principles of classical electromagnetism and waves: mechanical waves, Coulomb's law, electric fields, Gauss's law, Faraday's law, AC circuits, electromagnetic waves, geometrical optics.</p>	3