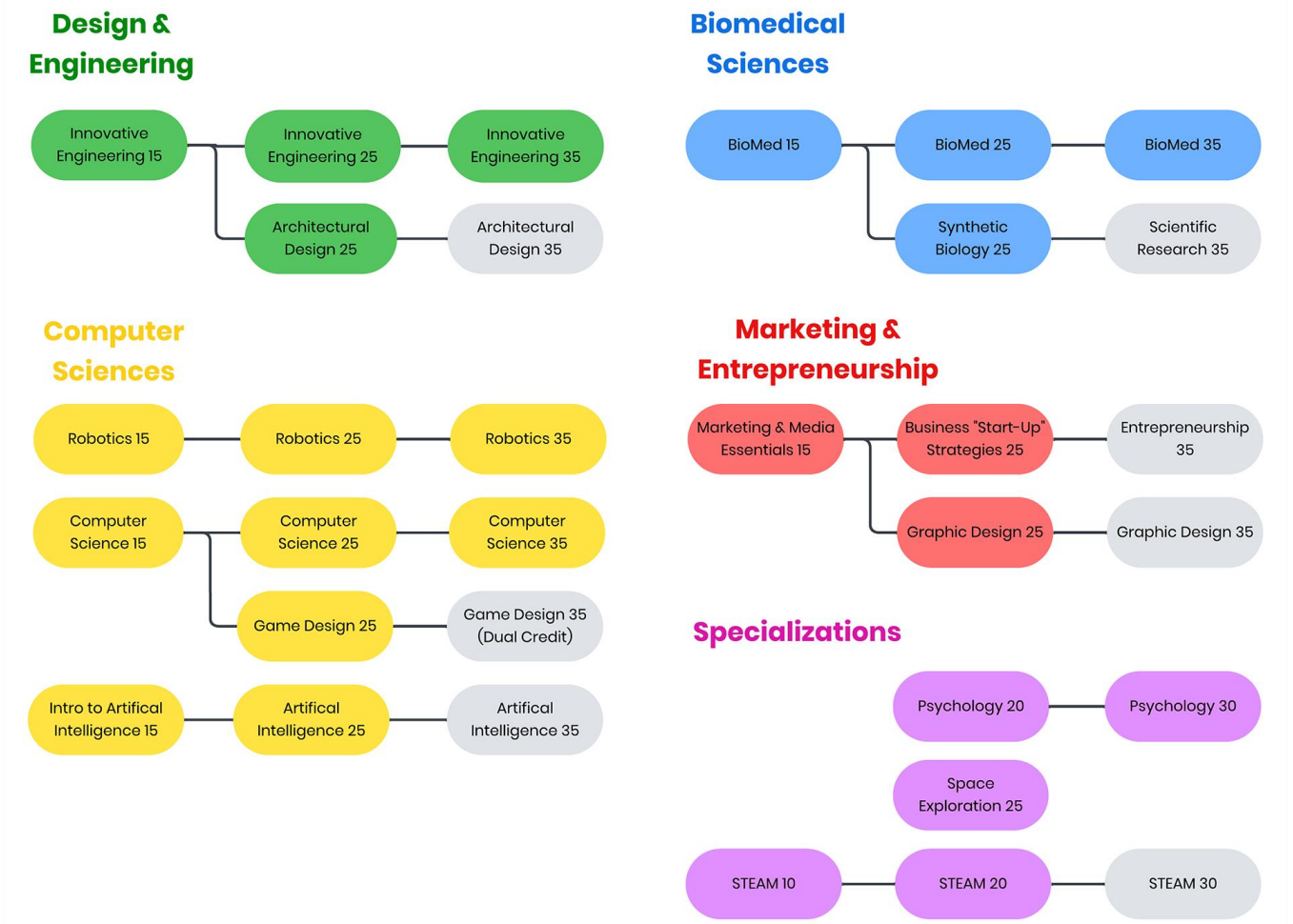
STEMCOLLEGIATE EDMONTON
4703 52 AVE. NW, EDMONTON, ALBERTA T6B 3R6 | 587-921-6866 | STEMCOLLEGIATE.CA

High School Options and Descriptions

Course descriptions serve as a guide to help students predict the content of the course. Due to the nature of technological innovations and each teacher's individual skillsets, there may be slight deviations in each course as the term progresses.



Not all courses will be offered each term/year! Course offerings will highly depend on teacher availability, student enrollment, and the results of student interest surveys.

Design and Engineering Strand

Innovative Engineering 15 (5 Credits)
"Innovative Engineering 15" is designed to inspire students to think creatively and to have the confidence to develop inventive solutions to complex, real-world problems. Through a blend of theoretical instruction and hands-on projects, students will delve even deeper into the design thinking process, refining their planning and sketching and design skills, all while utilizing advanced 3D modeling software, 3D printers, and laser cutters. Students will then have an opportunity to apply their skills to develop innovative solutions to relevant and impactful challenges. Are you ready to engineer the solutions for tomorrow? It all begins here in Innovative Engineering 15.

Innovative Engineering 25 (5 Credits) - *Requires Innovative Engineering 15*
Building on the foundations from Innovative Engineering 15, students will refine their skills in technical drafting and engineering design. They will tackle a series of real-world design scenarios, create intricate technical drawings that meet industry standards, develop familiarity with mechanical and structural systems, and learn to use 3D printers, CNC and Laser cutting technology to bring their designs to life. Then, with a student-centered final project, they will tackle real-world design challenges and showcase their ability to manage and execute larger, more comprehensive projects. This course is your gateway to solving tomorrow's engineering problems today. Are you ready to take your innovation to the next level?

Innovative Engineering 35 (5 Credits) - *Requires Innovative Engineering 25*
Step into the future of engineering with this capstone course! In Innovative Engineering 35, you'll master the art of 3D design, refine advanced technical drafting techniques, and delve into industrial design to create innovative, user-focused solutions. Explore cutting-edge trends and the role of the designer in shaping tomorrow's world with "The Future of Design." To finish it all off, you will complete a final "Capstone" project" where you'll tackle real-world challenges, manage complex projects, and present your visionary solutions with confidence. This is your chance to lead the way in engineering innovation.

Architectural Design 25 (5 Credits) - *Requires Innovative Engineering 15*
Embark on a journey into the world of architectural innovation with this exciting course! Students will develop expertise in architectural design, perfecting their drafting and design skills, and will explore intermediate CAD techniques and virtual modeling environments to bring their ideas to life in dynamic digital environments. To showcase their skills, students will tackle a final project where they will confront meaningful architectural challenges and create professional-level designs that showcase your creativity and technical prowess. Step into the role of an architect and start designing the spaces of tomorrow!

Architectural Design 35 (5 Credits) - *Requires Architectural Design 25*
Future Course - In Development
In Architectural Design 35, you'll explore advanced technical drawing techniques, dive deep into architectural design principles, and craft visionary interior and landscape solutions. Tackle real-world challenges through your personalized Capstone Project, showcasing your ability to design, refine, and present architectural concepts with professional precision. Whether shaping interiors, crafting outdoor spaces, or designing entire structures, this course empowers you to create inspiring environments. Are you ready to leave your mark on the world of architecture?

Computer Sciences Strand

Robotics 15 (5 Credits)
Step into the world of intelligent machines in Robotics 15, where students build, program, and bring robots to life! Students will dive deep into the world of robotics, and learn how mechanical systems, electronics, and sensors work together to solve real-world problems. Along the way, they will develop creative thinking and technical skills as they tackle challenges and design robots that respond to their environment. The course wraps up with a student-driven robotics project—your chance to invent, build, and showcase your own robotic creation!

Robotics 25 (5 Credits) - *Requires Robotics 15*
Students will take their robotics skills to the next level with Robotics 25, where smart machines meet real-world systems. In this course, students will investigate advanced robotic platforms and learn to program them with increasing precision and complexity. They will explore process control systems, automate tasks, and gain a deeper understanding of how robotics lead the charge within industry applications. Through hands-on builds, sensor integration, and custom programming challenges, they will solve complex automation problems and complete capstone projects that put their skills to the test. Think bigger, build smarter, and get ready for a future driven by intelligent automation.

Robotics 35 (5 Credits) - *Requires Robotics 25*
In Robotics & Automation 35, you'll take on the future of intelligent machines. Dive into advanced robotics systems that incorporate decision-making, logic, and feedback loops to create smart, adaptable solutions. Explore expert systems that mimic human reasoning and bring new levels of precision and autonomy to robotic control. With a focus on innovation, engineering, and problem-solving, you'll design, build, and refine your own complex system in a major capstone project. Anything from factory floors to space exploration, this course prepares you to shape the technologies that lead our industries.

Computer Science 15 (5 Credits)
Start your journey into the world of coding and digital creativity in Computer Science 15. Students will learn how to think like a programmer, breaking problems into steps, writing clear instructions, and building their own programs from scratch. They will explore both structured and client-side scripting as they create interactive tools and simple web features. Throughout the process they will build their coding fluency, strengthen their logic, and gain confidence in designing their own digital solutions to everyday problems. The course wraps up with a self-directed project where they have the flexibility to bring their own coding creation to life!

Computer Science 25 (5 Credits) - *Requires Computer Science 15*
Time to take your coding skills to the next level with Computer Science 25, where students will dive deeper into problem-solving, data structures, and procedural programming techniques as they tackle real-world coding challenges. Students will explore a second programming language to expand their versatility, all the while preparing for careers in software development, AI, game design, and more. The course culminates in an advanced capstone project where students get the chance to bring their ideas to life through thoughtful design and efficient code. Build smarter, code cleaner, and shape the future — one program at a time.

Computer Science 35 (5 Credits) - *Requires Computer Science 25*
Push your programming skills to a professional level in Computer Science 35, where advanced logic meets software design. You'll dive into object-oriented programming and create modular, scalable programs that reflect real-world applications. Learn how modern software is built — from classes and inheritance to reusable code and clean architecture. This course challenges you to think like a developer, build with intention, and explore complex systems through hands-on problem-solving. Finish your journey with a major independent project that showcases everything you've learned. Whether you're planning a future in tech or just love the thrill of creating, this is your launchpad to what's next.

Game Design 25 (5 Credits) - Requires Computer Science 15
In Game Design and Development 25, you will design and program your own video games using real tools and techniques used by professionals. You will delve into game theory, learn how to create game mechanics, design characters and environments, and have ultimate control over how your game looks, sounds, and feels. By the end of the course, you will have created original games you can share and showcase, while building skills that connect directly to careers in game development, software design, and digital media.

Intro to Artificial Intelligence 15 (5 credits)
Step into the world of intelligent technology in Intro to AI 15, where you'll explore how machines learn, think, and make decisions. This beginner-friendly course introduces the core concepts behind artificial intelligence like algorithms, data sets, neural networks, and machine learning through hands-on activities, games, and simulations. You'll also examine how AI is already shaping your world, from social media to smart assistants, and debate its growing influence on privacy, work, and society. Whether you're coding a basic chatbot or analyzing how AI makes recommendations, this course builds the essential skills and ethical awareness to be an informed digital citizen in the age of intelligence.

Intro to Artificial Intelligence 25 (5 credits) *- Requires AI 15*
Intro to AI 25 challenges you to move beyond simply using AI tools and begin understanding how they work, why they matter, and how they should be designed. As the second course in the AI sequence, this class deepens your critical thinking skills and challenges you to assess safeguards, analyze misinformation, explore global AI policies, and consider emerging career pathways in the field. You will explore how artificial intelligence systems gather and process data, how machine learning models and neural networks are trained, and how technologies such as transformers and generative AI create text, images, and other media. Through hands-on use and analysis of AI tools, you will evaluate how algorithms perform in real-world contexts such as gaming, communication, sustainability, and the legal system, and investigate how bias, privacy, and intellectual property issues shape responsible AI development. If you are ready to think critically about intelligent systems and engage thoughtfully with the technologies shaping the future, this course will equip you with the knowledge, confidence, and ethical awareness to do so.

Artificial Intelligence 35 (5 Credits) *- Requires AI 25*
Future Course - In Development
AI 35 is a deep dive into artificial intelligence as a design, innovation, and problem-solving tool. Tackle real-world challenges using advanced AI tools—like generative models, computer vision, or natural language processing—and explore their use in healthcare, climate science, media, robotics, and more. This course emphasizes critical design thinking and collaboration as students create capstone projects that address a real-world issue using AI. You'll also explore the future of work, ethical dilemmas in surveillance and automation, and the global impact of intelligent systems. If you're ready to go from AI user to AI innovator, this is your launchpad.

Marketing and Media Strand

Marketing and Media Essentials 15 (5 Credits)
Step into the dynamic world of marketing and media with this foundational course! Designed for aspiring entrepreneurs and creative minds, students will learn the essentials of management and marketing strategies to support a small business venture. Students will also increase their reach, developing valuable marketing and graphic design skills, exploring tools for creating eye-catching digital designs, and building their first professional website to showcase their business ideas. With a focus on blending creativity and strategy, this course sets the stage for turning your ideas into impactful marketing solutions. Are you ready to bring your vision to life?

Business "Start-Up" Strategies 25 (5 Credits) - *Requires Marketing and Media 15*
Take your entrepreneurial skills to the next level with "Start-up Strategies 25", a hands-on business venture course! Building on the skills from Marketing essentials, students will gain the skills to manage and grow a successful small business. This course is focused on analyzing opportunities, making wise financing strategies, and creating a detailed venture plan. Students will also learn how to craft impactful marketing strategies and explore the influence of media on consumer behavior. By blending financial insight, marketing expertise, and their own entrepreneurial vision, this course empowers them to turn ideas into thriving ventures. Are you ready to make your mark in the world of business?

Entrepreneurship 35 (5 Credits) - *Requires Business "Start-Up" Strategies 25*
****Future Course - In Development****
Bring your entrepreneurial vision to life in this exciting capstone course! Entrepreneurship 35 challenges you to develop advanced skills in venture management, brand identity, and advertising strategy. You'll explore how to expand a business while designing a complete marketing campaign that captures your creative vision. The highlight of this course is an interdisciplinary Capstone Project, where you'll leverage your other STEM talents to create and pitch a fully realized STEM product, brand and business concept of your choice. Are you ready to showcase your entrepreneurial spirit and launch your big idea?

Graphic Design 25 (5 Credits) - *Requires Marketing and Media 15*
Elevate your graphic and web design skills in this creative and dynamic course! Building on the foundations of Marketing and Media 15, students will explore advanced techniques in raster and vector graphics, refine their web design skills, and dive into the fundamentals of animation. With an opportunity to specialize in intermediate animation, or complete a self-directed design project, this course is perfect for those looking to craft stunning visuals and professional-grade websites and graphics. Whether creating vibrant digital art or building interactive animations, this course empowers you to bring your creative ideas to life. Are you ready to design your future?

Graphic Design 35 (5 Credits) - *Requires Graphic Design 25*
Future Course - In Development
Push your creativity to new heights in this advanced graphic design course! Explore sophisticated techniques in raster and vector graphics and master the basics of "rich media"; dynamic content that transforms static websites into engaging user experiences. Learn to incorporate animations, interactive elements, and multimedia features that captivate audiences and enhance viewer engagement. Then, decide whether to refine your animation skills or dive deeper into programming for interactive web applications. You will finish with a Capstone Project where you'll bring all your skills together to design and present a professional-grade digital portfolio website that is ready to show to future employers.

Biomedical Sciences Strand

Biomedical Science 15 (5 Credits)
Step into the fascinating world of healthcare, human biology, and medical innovation. Biomedical Sciences 15 is your first step into a high-demand, high-impact field. In this introductory course, you'll explore what it means to be healthy by examining the major systems of the human body, and the science behind disease and prevention. Learn how the body works, inside and out, from cells to organ systems, and how lifestyle choices, pathogens, and aging influence our physical well-being.
You'll build hands-on knowledge in medical vocabulary, anatomy, vital signs, and basic pathology, while developing the safety protocols and hygiene practices used by healthcare professionals. You'll also explore ethics, confidentiality, and the roles of healthcare workers in community and clinical settings.
This course is ideal for students interested in health science, medicine, nursing, physiotherapy, or biotechnology. It also lays the groundwork for future Biomedical Science and microbiology courses, where you'll go deeper into medical technology, diagnostics, and patient care. Are you ready to explore the science that saves lives?
*** A key component of this course is earning your First Aid and CPR with AED certification, preparing you to respond confidently in emergency situations, an essential skill for any healthcare or life science pathway!**

Biomedical Science 25 (5 Credits) - *Requires Biomedical Science 15*
Delve deeper into the complexities of healthcare with BioMed 25, a course centered on immunity, disease, and chronic conditions. Explore the intricate connections between nature and wellness and gain advanced insights into the body's immune defenses and their role in preventing and fighting illness. Study the impact of chronic conditions on individuals and communities and develop strategies to enhance health outcomes. The course culminates with an interdisciplinary project, leveraging STEM discoveries to design innovative approaches to healthcare delivery. Whether you're passionate about immunology, public health, or innovative medical solutions, this course equips you to make a difference in the future of healthcare.

Biomedical Science 35 (5 Credits) - *Requires Biomedical Science 25*
Experience the future of healthcare in BioMed 35, the capstone course of this dynamic series. Develop advanced first aid and responder skills while gaining a deeper understanding of mental health and its impact on individuals and communities. Investigate cutting-edge medical technologies and their role in transforming healthcare delivery. The course culminates with a cross-curricular Capstone Project, where you'll apply your STEM knowledge to design innovative solutions for real-world medical challenges. BioMed 35 equips you with the skills, knowledge, and vision to contribute to the ever-evolving field of healthcare. Are you ready to lead the next generation of medical innovation?

Synthetic Biology 25 (5 Credits) – *Requires Biomedical Science 15*
Synthetic Biology 15 is a hands-on science course where healthcare integrates with bio-technology. In this collaborative, lab-based course, you will learn the tools and techniques used in modern microbiology and medical research, explore how genes are structured and expressed, and begin working with the foundational methods required for genetic isolation and "Synthetic Biology" (Genetic Engineering!). Through authentic laboratory experiences such as culturing microorganisms, applying molecular biology protocols, and analyzing experimental results, you will design and carry out your own investigation aimed at solving a real-world community problem. As part of this work, you will also explore how artificial intelligence can be used to analyze genetic data and enhance biological research, bridging biotechnology with emerging computational tools. Along the way, you will examine bioethics, biosafety, and the societal implications of genetic engineering while developing collaboration, communication, and critical thinking skills. If you are curious about medicine, genetics, biotechnology, or the future of scientific innovation, this course offers an exciting introduction to the rapidly evolving world of synthetic biology.

Scientific Research 35 (5 Credits) *– Requires Synthetic Biology 25 or 20 lvl sciences*

****Future Course - In Development****

Scientific Research 35 is an immersive, student-driven research experience designed for those ready to move beyond structured labs and into authentic scientific discovery. In this advanced course, you will design and execute your own original research project, with a strong emphasis on cell biology and microbiology, while also having the opportunity to propose alternative scientific focuses aligned with your interests. You will conduct literature reviews, develop research questions and hypotheses, design controlled experiments, collect and analyze data, evaluate sources of error, and draw defendable conclusions. Working collaboratively while taking leadership in your investigation, you will apply rigorous laboratory practices, maintain a scientific journal, and communicate your findings through formal presentations or scientific posters. This course mirrors the real work of professional researchers and prepares students for post-secondary science pathways by strengthening critical thinking, problem solving, and scientific communication skills. If you are motivated, independent, and ready to contribute meaningful knowledge to the scientific community, Scientific Research 35 offers an authentic platform to explore your curiosity and pursue excellence beyond the traditional classroom.

Specializations

STEAM 10 (5 Credits)
STEAM 10 is not your typical Art course. This is where creativity meets technology and imagination turns into innovation. In this hands-on, project-based class, you will design and build using a wide range of materials and media, blending visual art, construction tools, electronics, structured programming, and the design process into cohesive, creative projects. You might integrate simple circuits into artistic builds, explore foundational coding concepts to prototype interactive displays, or use digital tools to enhance physical creations. At the same time, you will develop strong visual composition skills and learn how to communicate ideas powerfully through design, using artistic thinking to showcase modern technology, highlight school initiatives, and bring technical concepts to life. If you enjoy building, designing, experimenting, and thinking differently, STEAM 10 will challenge you to see yourself as both an artist and an innovator.

STEAM 20 (5 Credits) - *Requires STEAM 10*
STEAM 20 builds on the creative foundation of STEAM 10 and pushes your ideas further through deeper integration of design, technology, and innovation. In this advanced, project-driven course, you will move beyond experimentation into purposeful creation, developing 3D models, producing animations, writing structured code, and designing control systems that bring your projects to life. You will learn how digital design, programming logic, and physical systems work together, while also exploring product management principles to plan, refine, and deliver polished outcomes. Projects become more complex, more technical, and more collaborative, challenging you to think not just as a creator, but as a designer, engineer, and project lead. If you are ready to elevate your creativity, integrate multiple technologies into cohesive builds, and transform ambitious concepts into functional, refined products, STEAM 20 is where your skills truly begin to converge.

STEAM 30 (5 Credits): - *Requires STEAM 20*
Future Course - In Development
Master the intersection of art and technology in STEAM 30, the capstone course in this series. Expand on the advanced skills developed in STEAM 20 by integrating intricate artistic techniques into your STEM projects. You'll explore complex design strategies, hone your ability to create multi disciplinary and professional-quality products, and develop a portfolio that showcases your ability to merge creativity and technical expertise. Analyze cutting-edge innovations in art and design and apply these principles to create groundbreaking solutions for modern challenges. In this final course, you'll truly redefine innovation through design.

Psychology 20 (Personal and General Psychology) (6 Credit)
Explore the fascinating world of human behavior and mental processes in this engaging course! Psychology 20 combines the best of both Personal and General Psychology, offering insights into individual development, personality, and the broader principles that shape our thoughts and actions. Dive into topics like personality development, the role of heredity and environment, perception, learning, and memory. Gain a deeper understanding of how biology influences behavior and explore how psychological principles are applied in everyday life. Whether you're interested in understanding yourself and others or preparing for future studies in psychology and related fields, this course offers the tools to think critically, analyze behavior, and appreciate the science of the mind.

Experimental Psychology 30/35 (6 Credit) - requires Psychology 20
Step into the world of experimental psychology and uncover the methods behind understanding human behavior. Experimental Psychology dives deep into the science of the mind, exploring research methods, data analysis, and real-world applications of psychological principles. Learn how experiments are designed, conducted, and interpreted, while gaining hands-on experience through research projects. Discover how biological, cognitive, and social factors influence behavior and examine contemporary issues in mental health and human development. Whether you're preparing for advanced studies or simply curious about the complexities of human thought and action, this course will sharpen your analytical skills and deepen your understanding of the human experience.

Space Exploration 25 - (6 Credits)
In Space Exploration 25, students trace humanity's journey beyond Earth, from the Space Race to the cutting-edge spacecraft exploring our solar system today. Along the way, students uncover how rockets evolved from wartime technology into the vessels of scientific discovery, and how satellites, space stations, and probes have expanded our view of the cosmos. Students will dive into the principles of rocket propulsion and spacecraft design, analyze real data from planetary missions, and evaluate the impact of asteroids, comets, and meteors on planetary evolution. This interdisciplinary course blends physics, astronomy, and engineering, and is perfect for aspiring scientists, explorers, and anyone curious about what lies beyond our world.