

APPLIED SCIENCE (APSC)

APSC 100 Engineering Practice 1 Units: 9.00

This course introduces fundamental professional engineering skills and provides an opportunity to apply engineering science and mathematics content in situations emulating professional practice. It consists of three modules: Module 1. Problem analysis and modeling; Module 2. Experimentation and measurement; Module 3: Engineering design. The course provides an introduction to personal learning styles, team dynamics, oral and written presentation skills, laboratory data collection, analysis and presentation, project management, information management, problem analysis and modeling, numeric computation, economics, design methodologies, and workplace safety.

Requirements: Program in BASC or UENG

Offering Term: FW

Offering Faculty: Fac of Engineering Appl Sci

APSC 101 Engineering Problem Solving and Modeling Units: 2.90

This course provides an opportunity for students to develop complex problem solving and critical thinking skills and to apply engineering science knowledge in modeling physical systems through computational software. Examples and project topics are chosen to complement instruction in engineering science and mathematics courses. Ethical, economic, and social factors are considered in engineering problem solving.

Requirements: APSC 101 Exclusions

Mathematics 0

Natural Sciences 0

Complementary Studies 18

Engineering Science 0

Engineering Design 17

Offering Faculty: Fac of Engineering Appl Sci

APSC 102 Experimentation and Design Units: 2.80

This course introduces concepts of planning and designing experiments determine or measure particular system characteristics.

The course content includes error analysis, data analysis and representation in Excel, and the design of experimental investigation for simple systems.

Requirements: APSC 101 Exclusions

Mathematics 0

Natural Sciences 16

Complementary Studies 0

Engineering Science 18

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 103 Engineering Design Project Units: 3.30

This is a client-based team design project which develops skills including design, project management, technical communications, and professionalism. Students work in teams to define problems, gather and identify appropriate information, work effectively with teammates, generate ideas, select ideas, and implement a solution to a presented problem from a client.

Requirements: APSC 101 Exclusions

Mathematics 0

Natural Sciences 0

Complementary Studies 18

Engineering Science 6

Engineering Design 16

Offering Faculty: Fac of Engineering Appl Sci

APSC 111 Physics I Units: 3.30

This course is an introduction to Newtonian mechanics in the context of engineering applications. Lecture topics are: vectors, motion of a particle, particle dynamics, work and energy, statics and dynamics of rigid bodies, conservation of energy, momentum, and collisions.

Requirements: Program in BASC or UENG

Offering Term: F

Mathematics 0

Natural Sciences 40

Complementary Studies 0

Engineering Science 0

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 112 Physics II Units: 3.30

This course continues from APSC 111 to introduce electricity and further develop fundamental ideas of mechanics in the context of engineering applications. Lecture topics include: oscillations and waves, electric charge, electrical current and resistance, EMF, D.C. circuits and electrical measurements, electric field and potential, magnetic fields and their origin, and electromagnetic induction.

Requirements: Prerequisite of APSC111 and APSC171 and registered in a BASC or UENG Academic Program.

Offering Term: W

Mathematics 0

Natural Sciences 30

Complementary Studies 0

Engineering Science 10

Engineering Design 0

Course Equivalencies: APSC 112 APSC 114

Offering Faculty: Fac of Engineering Appl Sci

**APSC 114 Electricity and Magnetism Units: 3.30**

This course continues from APSC 111 to introduce electricity and further develop fundamental ideas of mechanics in the context of engineering applications. Lecture topics include: oscillations and waves, electric charge, electrical current and resistance, EMF, D.C. circuits and electrical measurements, electric field and potential, magnetic fields and their origin, and electromagnetic induction.

Mathematics 0

Natural Sciences 30

Complementary Studies 0

Engineering Science 10

Engineering Design 0

Course Equivalencies: APSC 112 APSC 114

Offering Faculty: Fac of Engineering Appl Sci

APSC 131 Chemistry And Materials Units: 3.30

This course provides an introduction to the chemistry of materials: thermochemistry, heat, work, internal energy, enthalpy and the first law of thermodynamics; gas laws in ideal and non-ideal systems; phase equilibria in one component systems; concepts of bonding in the classification of materials; the physical, electrical and mechanical properties of metals, polymers, semiconductors and ceramics; techniques of characterizing materials.

Requirements: Program in BASC or UENG

Offering Term: F

Mathematics 0

Natural Sciences 40

Complementary Studies 0

Engineering Science 0

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 132 Chemistry and its Applications Units: 3.30

This course combines fundamentals of chemistry with the engineering issues associated with them. Areas of study are entropy and the second law of thermodynamics, thermodynamics, chemical equilibrium, electrochemistry, chemical kinetics and organic chemistry. Environmental issues associated with each of these topics will be incorporated into lectures when appropriate.

Requirements: Prerequisite: APSC131. Must be registered in a BASC or UENG program.

Offering Term: W

Mathematics 0

Natural Sciences 30

Complementary Studies 0

Engineering Science 10

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 141 Personal Computers In Engineer Units: 2.00

The course provides an introduction to the role and application of computers and computing in modern engineering practice. The course is divided into modules covering the application of personal computer software to symbolic analysis and data analysis, and in the preparation of technical reports and presentations. Each module will be examined separately. Students must pass all modules to pass the course.

Requirements: Program in BASC or UENG

Offering Term: F

Mathematics 0

Natural Sciences 0

Complementary Studies 0

Engineering Science 24

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 142 Intro Computer Program Engrs Units: 3.00

This course introduces concepts, theory and practice of computer programming. Implementation uses microcomputers. The emphasis is on the design of correct and efficient algorithms and on programming style.

Applications are made to engineering problems. NOTE: The fall term delivery of this course is intended for students in the ECE direct-entry program, and enrolment in this term will require permission of the Associate Dean (Academic).

Requirements: Program in BASC or UENG

Offering Term: W

Mathematics 0

Natural Sciences 0

Complementary Studies 0

Engineering Science 24

Engineering Design 12

Offering Faculty: Fac of Engineering Appl Sci

APSC 143 Introduction to Computer Programming for Engineers Units: 3.30

This course introduces concepts, theory and practice of computer programming. Implementation uses microcomputers. The emphasis is on the design of correct and efficient algorithms and on programming style.

Applications are made to engineering problems.

Mathematics 0

Natural Sciences 0

Complementary Studies 0

Engineering Science 40

Engineering Design 0

Course Equivalencies: MNTC 313 APSC 143

Offering Faculty: Fac of Engineering Appl Sci

APSC 151 Earth Systems Engineering Units: 3.30

This course provides an introduction to the complex Earth System (the solid earth, hydrosphere, atmosphere, and biosphere) and our interactions with it. The science behind our exploration and understanding of our planet and its ongoing evolution is explored in combination with the engineering geology of geo-materials, geo-resources, geo-dynamics and geo-risk. The connection between the Earth System and human activity is explored in depth, including local and global-scale impacts of engineering works, geopolitics, and resource issues. Examples of the terrestrial sources of geo-materials used in engineering activities are highlighted along with the technical, social, economic and environmental challenges associated with their life cycle including sustainability, contamination, biodiversity loss, social impact and climate change.

Requirements: Program in BASC or UENG

Offering Term: F

Mathematics 0

Natural Sciences 17

Complementary Studies 8

Engineering Science 15

Engineering Design 0

Course Equivalencies: GEOL 104/105 / APSC 151

Offering Faculty: Fac of Engineering Appl Sci

APSC 161 Engineering Graphics Units: 3.50

The principal objectives of the course are (1) to develop the student's ability to visualize and communicate three-dimensional shapes and (2) to acquire the skills needed to use computer-aided design software. Topics covered are orthographic projection, isometric sketching, auxiliary and section views as well as dimensioning and working drawings.

Computer-aided design software is used to create solid models of the parts and assemblies as well as to generate dimensioned drawings. Students apply their learning in a project where they design their own version of a consumer product. Students learn by hands-on exercises in free-hand sketching and computer-based drawing.

Requirements: Program in BASC or UENG

Offering Term: F

Mathematics 0

Natural Sciences 0

Complementary Studies 0

Engineering Science 37

Engineering Design 5

Offering Faculty: Fac of Engineering Appl Sci

APSC 162 Engineering Graphics Units: 2.50

The principal objectives of the course are (1) to develop the student's ability to visualize and communicate three-dimensional shapes and (2) to acquire the skills needed to use computer-aided design software. Topics covered are orthographic projection, isometric sketching, auxiliary and section views as well as dimensioning and working drawings. Computer-aided design software is used to create solid models of the parts and assemblies as well as to generate dimensioned drawings. Students apply their learning in a project where they design their own version of a consumer product. Students learn by hands-on exercises in free-hand sketching and computer-based drawing.

Mathematics 0

Natural Sciences 0

Complementary Studies 0

Engineering Science 20

Engineering Design 10

Offering Faculty: Fac of Engineering Appl Sci

APSC 171 Calculus I Units: 3.30

Graphs and derivatives of vector-valued functions; related applications. Implicit derivatives and related rate applications. Fundamental Theorem of Calculus, Riemann integral; applications to problems involving areas, volumes, mass, charge, work, etc. Integration by substitution, by parts, and partial fractions. Introduction to second-order differential equations and complex numbers.

Requirements: Program in BASC or UENG

Offering Term: F

Mathematics 40

Natural Sciences 0

Complementary Studies 0

Engineering Science 0

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 172 Calculus II Units: 3.30

This course continues calculus concepts from APSC-171, including space curves, speed, velocity. Functions of several variables, partial derivatives, differentials, error estimates, gradient, maxima and minima. Double and triple integrals, polar and cylindrical coordinates; applications to mass, center of mass, moment. Series, power series; Taylor polynomial approximations, error analysis.

Requirements: APSC171

Offering Term: W

Mathematics 40

Natural Sciences 0

Complementary Studies 0

Engineering Science 0

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

**APSC 174 Introduction To Linear Algebra Units: 3.30**

Systems of linear equations; real vectors spaces and subspaces; linear combinations and linear spans; linear dependence and linear independence; applications to systems of linear equations and their solution via Gaussian elimination; bases and dimension of real vector spaces; linear transformations, range, kernel and Rank-Nullity theorem; matrix representation of a linear transformation; composition of linear transformations and matrix multiplication; invertible matrices and determinants; eigenvalues and eigenvectors of square matrices. Applications of the course material to engineering systems are illustrated.

Requirements: Program in BASC or UENG

Offering Term: W

Mathematics 40

Natural Sciences 0

Complementary Studies 0

Engineering Science 0

Engineering Design 0

Course Equivalencies: MATH 110B/112 / APSC 174

Offering Faculty: Fac of Engineering Appl Sci

APSC 182 Applied Engineering Mechanics Units: 1.70

Identification, visualization and quantification of forces on elements and forces within statically determinate engineering structures and systems. Two- and three-dimensional force equilibrium of rigid bodies; force distribution within engineering systems like simple trusses, frames and machines; internal shear forces and bending moments in force carrying elements; and engineering stress and strain.

Mathematics 0

Natural Sciences 0

Complementary Studies 0

Engineering Science 15

Engineering Design 5

Offering Faculty: Fac of Engineering Appl Sci

APSC 199 English Proficiency for Engineers Units: 0.20

This course develops skills that are necessary to organize and present technical information in a professional context. At the end of the course students will demonstrate English proficiency in listening comprehension and written expression.

Offering Term: FW

Mathematics 0

Natural Sciences 0

Complementary Studies 1

Engineering Science 0

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 200 Engineering Design & Practice II Units: 4.00

In this course students will participate constructively on teams to create solutions to open-ended complex problems, using standard design methods and tools. This project-based course provides instruction primarily in the first 6 weeks of the semester focusing on problem scoping, creativity and idea generation, decision making incorporating technical, economic, societal, and environmental factors, safety, engineering codes and regulations, and engineering ethics. The final 6 weeks of the course centre around a design project delivered by each discipline. This course is integrated with APSC-293, and coordinated by the same instructor.

APSC 293 Note: For students taking the CHEE/ENCH sections of APSC 200, CHEE 210 and CHEE 223 are corequisite courses.

Requirements: Prerequisite: APSC 100 or APSC 103; have passed the English Proficiency Test Corequisite: APSC 293A/B or APSC 293 Exclusions: MECH 212, APSC 202

Offering Term: FW

Mathematics 0

Natural Sciences 0

Complementary Studies 12

Engineering Science 0

Engineering Design 36

Offering Faculty: Fac of Engineering Appl Sci

APSC 202 Engineering Design and Practice II: Client-Based Design Units: 4.30

In this course students will participate constructively on teams to create solutions to client-based open-ended design problems using standard design methods and tools. This project-based course provides instruction on problem scoping, creativity and idea generation, decision making incorporating technical, economic, societal, and environmental factors, safety, engineering codes and regulations, and engineering ethics. Students work in teams to define problems, gather and identify appropriate information, work effectively with teammates, generate ideas, select ideas, and implement a solution to a presented problem from a client. This course is integrated with APSC-293, and taught by the same instructor. NOTE: This course is only open to students transferring into year 2 or above of a Queen's Engineering program.

Requirements: Prerequisites: APSC 101 and pe

Mathematics 0

Natural Sciences 0

Complementary Studies 16

Engineering Science 0

Engineering Design 36

Offering Faculty: Fac of Engineering Appl Sci

APSC 204 C++ Programme Units: 5.50

Offering Faculty: Fac of Engineering Appl Sci

APSC 221 Economic And Business Practice Units: 3.00

This course will provide the student in the Engineering program with the ability to appropriately incorporate selected economic and business practices into the practice of engineering. The practices covered include: business planning for the enterprise, enterprise economic analysis, project management process, project economic analysis, risk analysis and management, quality management and change management. Assignments and examples are based on situations from engineering based industries.

Requirements: Anti-requisites for APSC221

Offering Term: F

Mathematics 0

Natural Sciences 0

Complementary Studies 36

Engineering Science 0

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 223 Global Project Management Units: 3.00

This course will cover the knowledge areas and processes of the globally-recognized PM Body of Knowledge: integration, scope, cost, time, risk, human resources, stakeholders and procurement management. The focus will be a practical, applied approach, utilizing the global city of London, its engineering firms, experts, practitioners and massive engineering undertakings (The Shard, Cross-Rail, the Eurotunnel, the Thames Barrier, etc.) to investigate the problems, challenges and successes of managing global engineering projects. Note that the first week of instruction for this course will be held at Queen's, prior to the start of the 6-week BISC-based workshop.

Mathematics 0

Natural Sciences 0

Complementary Studies 36

Engineering Science 0

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 250 Biology Through an Engineering Lens Units: 3.50

This course provides an introduction to biology and biochemistry, and their applications in cell-based engineering systems and processes. Students will obtain a basic background in biology, including the biology of bacteria, fungi, viruses and human cells. These concepts will be related to applications relevant to modern engineering and will be taught from a systems engineering perspective through the lens of societal need. This will include such applications as; bioremediation for the treatment of waste water, production of vaccines, biomedical and biomechanical devices, and regenerative medicine. While taught from an engineering perspective, the course would be relevant to any student interested in the application of biology, and is designed to provide relevant examples across multiple disciplines. The course assumes basic first year level science knowledge.

Requirements: Exclusions: CHEE 229

Mathematics 0

Natural Sciences 30

Complementary Studies 0

Engineering Science 12

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 262 Engineering Surveying Units: 3.50

This introductory course in plane surveying consists of about 16 hours of lectures, the rest of the time being spent in the field. Lecture material includes distance measurement, differential, profile and indirect leveling and use of transit, traversing and mapping. Errors, corrections and balancing are also discussed. The use of available software packages for the reduction and calculation of data is encouraged throughout the course. In the field, students practice the basic techniques of instrument use through various assignments. Careful and efficient handling of instruments and proper note-keeping are stressed. The use of state-of-the-art electronic surveying instruments is included in the field assignments wherever possible. The school is held on campus immediately following the final First Year examination in April.

Offering Term: N

Mathematics 0

Natural Sciences 0

Complementary Studies 0

Engineering Science 40

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

**APSC 291 Engineering Communications I Units: 1.00**

This course provides an introduction to effective engineering writing and speaking skills with the emphasis on technical proposals, professional correspondence, engineering reports, and oral briefings. These skills are developed in lectures and small group tutorials.

Requirements: APSC291 Exclusions

Offering Term: F

Mathematics 0

Natural Sciences 0

Complementary Studies 12

Engineering Science 0

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 293 Engineering Communications Units: 1.00

Prerequisites: APSC 100, Corequisites: APSC 200 or permission of the instructor, Exclusions: APSC 292, CHEE 260, ELEC 291, ELEC 391, GEOE 291 (or GEOL 291), GEOE 292 (or GEOL 292), MECH 290.

This course provides an introduction to effective engineering writing and speaking skills with the emphasis on professional correspondence, engineering reports, oral briefings, and formal oral presentations. These skills are developed in lectures and small group tutorials. This course is integrated with APSC-200, and coordinated by the same instructor.

Requirements: APSC293 Prereq Coreq Exclusi

Offering Term: FW

Mathematics 0

Natural Sciences 0

Complementary Studies 12

Engineering Science 0

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 300 Professional Internship Units: 3.00

Offering Term: F

Offering Faculty: Fac of Engineering Appl Sci

APSC 301 Professional Internship Units: 3.50

The professional internship involves spending a minimum of twelve months and a maximum of sixteen months in a paid internship position in industry or government. Students in the 12-month internship must register in APSC 302, APSC 303 and either APSC 301 or APSC 304. Students in the 16-month placement take APSC 301, APSC 302, APSC 303 and APSC 304. The Internship Coordinator must be satisfied that the work carried out has educational merit. The course includes workshops on interviewing, resume preparation and work performance. Successful completion of the course requires submission of a report of high quality on the experience within thirty days of completion of the work period. Career Services manage the non-academic aspects of the course.

Requirements: BASC Professional Internship

Offering Term: S

Mathematics 0

Natural Sciences 0

Complementary Studies 21

Engineering Science 21

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 302 Professional Internship Units: 3.50

The professional internship involves spending a minimum of twelve months and a maximum of sixteen months in a paid internship position in industry or government. Students in the 12-month internship must register in APSC 302, APSC 303 and either APSC 301 or APSC 304. Students in the 16-month placement take APSC 301, APSC 302, APSC 303 and APSC 304. The Internship Coordinator must be satisfied that the work carried out has educational merit. The course includes workshops on interviewing, resume preparation and work performance. Successful completion of the course requires submission of a report of high quality on the experience within thirty days of completion of the work period. Career Services manage the non-academic aspects of the course.

Requirements: BASC Professional Internship

Offering Term: F

Mathematics 0

Natural Sciences 0

Complementary Studies 21

Engineering Science 21

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 303 Professional Internship Units: 3.50

The professional internship involves spending a minimum of twelve months and a maximum of sixteen months in a paid internship position in industry or government. Students in the 12-month internship must register in APSC 302, APSC 303 and either APSC 301 or APSC 304. Students in the 16-month placement take APSC 301, APSC 302, APSC 303 and APSC 304. The Internship Coordinator must be satisfied that the work carried out has educational merit. The course includes workshops on interviewing, resume preparation and work performance. Successful completion of the course requires submission of a report of high quality on the experience within thirty days of completion of the work period. Career Services manage the non-academic aspects of the course. Note that some programs may accept this course as part of their technical elective requirements. Credit may only be granted to students who have successfully fulfilled the necessary requirements to receive the Professional Internship designation.

Requirements: BASC Professional Internship

Offering Term: W

Mathematics 0

Natural Sciences 0

Complementary Studies 21

Engineering Science 21

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 304 Professional Internship Units: 3.50

The professional internship involves spending a minimum of twelve months and a maximum of sixteen months in a paid internship position in industry or government. Students in the 12-month internship must register in APSC 302, APSC 303 and either APSC 301 or APSC 304. Students in the 16-month placement take APSC 301, APSC 302, APSC 303 and APSC 304. The Internship Coordinator must be satisfied that the work carried out has educational merit. The course includes workshops on interviewing, resume preparation and work performance. Successful completion of the course requires submission of a report of high quality on the experience within thirty days of completion of the work period. Career Services manage the non-academic aspects of the course.

Requirements: BASC Professional Internship

Offering Term: S

Mathematics 0

Natural Sciences 0

Complementary Studies 21

Engineering Science 21

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 335 History Of Engineering I Units: 3.00

Offering Faculty: Fac of Engineering Appl Sci

APSC 336 History Of Engineering II Units: 3.00

Offering Faculty: Fac of Engineering Appl Sci

APSC 381 Advanced Design and Skills for Innovation Units: 3.50

This multidisciplinary project-based course will provide students with a broad range of knowledge and skills for design and innovation. Topics span the breadth of the innovation process, including advanced topics such as risk analysis, FMEA, reliability, and elements of six sigma methodologies. Elements of project management, market and economic analysis, and other professional practice topics are interwoven. Students work in multidisciplinary teams on relevant and realistic projects, simulating the real-world engineering environment.

Requirements: Successful completion of all 2nd yr core courses. Only students registered in yr 3 can add APSC 381. If the course is full you may contact the instructor to be added to a waitlist. Students registered as year 4+ may contact the instructor for permission.

Offering Term: W

Mathematics 0

Natural Sciences 0

Complementary Studies 0

Engineering Science 0

Engineering Design 42

Offering Faculty: Fac of Engineering Appl Sci



APSC 400 Technology, Engineering & Management (TEAM) Units: 7.00

Multidisciplinary teams of engineering, commerce, law, and/or science students, as appropriate, undertake consulting projects with industrial, government, and not-for-profit clients. Typical project types include Process Improvement, Feasibility & Design, Business Strategy/Marketing, Environmental, Start-ups, Blue-Sky, or a combination of topics which are selected based on prevailing industry trends. Following a phase of self-directed problem and scope definition, students will execute their projects in groups, guided by experienced professionals. Students will receive formal training in project management and participate in guest lectures by industry experts. Students interact regularly with clients at a technical and management level. The course concludes with a comprehensive report and presentation to the client. Participation in the course is by selection. Students must apply for admission into the course by providing a copy of their resume, unofficial transcript, and a cover letter substantiating their interest in the course. More information can be found on the course website: <http://team.appsci.queensu.ca/>

Prerequisite: Completion of 3rd year core courses

Requirements: Exclusion: APSC 401

Offering Term: FW

Mathematics 0

Natural Sciences 0

Complementary Studies 42

Engineering Science 0

Engineering Design 42

Offering Faculty: Fac of Engineering Appl Sci

APSC 401 Interdisciplinary Projects Units: 4.50

Multidisciplinary teams of engineering, commerce, law, science, social science, and humanities students, as appropriate, undertake consulting projects with industrial, government, and not-for-profit clients. Typical project types include social innovation, process improvement, business strategy/marketing, environmental, start-ups, blue-sky, or a combination of topics which are selected based on societal and industry interests. This is a winter term course, but students will meet with their teams and client at the end of the fall term. Following a phase of self-directed problem and scope definition, students will execute their projects in groups, guided by experienced professionals. Students will receive formal training in project management, effective teaming, client interaction, and communication in professional environments. Students interact regularly with clients at a technical and management level. The course concludes with a comprehensive report and presentation to the client. Participation in the course is by selection. Students must apply for admission into the course by providing a copy of their resume, unofficial transcript, and a cover letter substantiating their interest in the course. This course is co-taught with instructors teaching the equivalent courses in other Faculties.

Requirements: Completion of 3rd year core courses and permission of the instructor.

Offering Term: W

Mathematics 0

Natural Sciences 0

Complementary Studies 27

Engineering Science 0

Engineering Design 27

Offering Faculty: Fac of Engineering Appl Sci

APSC 480 Multi-disciplinary Industry Units: 9.00

This course will enhance student's design, innovation, critical thinking, and professional skills by experiencing real-time industry-funded projects. Working in multidisciplinary teams, students are guided by experienced engineering professionals both internally and externally. Teams interface frequently with the client, including occasional external site visits. Projects cover a broad range of engineering disciplines, and often incorporate the development of physical prototype(s) or digital models/simulations for evaluation and testing, as well as techno-economic elements. Students will integrate elements of engineering design, innovation, and professional practice from prior courses, with enhancements from occasional lectures, workshops, and guest speakers. Project funding supports all necessary travel, communication, software, equipment, prototyping components and related services. Professional engineering skills such as communication, teamwork, project management, engineering economics, ethics, and safety will be integral to the projects.

Requirements: Enrollment may be requested by contacting the Instructor. Must be registered in BSCE or BASC.

Offering Term: FW

Mathematics 0

Natural Sciences 0

Complementary Studies 0

Engineering Science 0

Engineering Design 0

Offering Faculty: Fac of Engineering Appl Sci

APSC 801 Master of Engineering Foundations Units: 0.00

An introduction to the Master of Engineering (MEng) graduate studies program at Queen's University. The course provides students with essential administrative information, an introduction to information literacy within the Faculty of Engineering and Applied Science, as well as an overview of the various support services on campus. Additionally, the course contains several modules on professional and career skills. This non-credit course is comprised of a number of individual modules, and its completion is a requirement to graduate from the MEng program. Graded on a Pass/Fail basis.

Prerequisites: Enrolment in the MEng program.

Exclusions: Students not enrolled in the MEng program.

Offering Term: FW

Offering Faculty: Fac of Engineering Appl Sci

APSC 810 Teaching and Learning in Engineering Units: 3.00

This course is an introduction to learning principles and effective teaching in engineering, intended to prepare for roles like teaching assistant, university course instruction, or training in engineering industry. The course includes relevant theories of teaching and learning with practical elements like classroom management, designing sessions and assessments, signature engineering teaching approaches, and using digital pedagogies.

Offering Term: FW

Offering Faculty: Fac of Engineering Appl Sci

APSC 812 AI Ethics and Society Units: 3.00

This course investigates the ethical implications of Artificial Intelligence (AI) as a social, technological and cultural phenomenon. Given the increasing use of intelligent systems for decision-making and autonomous control, it is essential that designers and developers are aware of the ethical and social implications that AI can have. The course materials will examine fundamental ethical principles related to the application of AI and investigate its influence in a number of industries including self-driving vehicles, healthcare, law and defense. The course will also examine the delicate balance between innovations in AI versus regulation, privacy, and individual rights. This course is graded on a Pass/Fail basis.

Offering Faculty: Fac of Engineering Appl Sci

APSC 877 Engineering Project Management Units: 3.00

The course will examine the essential skills and knowledge required for effective engineering project management. The foundational principles of project management including integration, scope, cost, time, human resources, stakeholders and procurement are examined. The course will be delivered online.

Exclusions: MECH 896, APSC 223

Offering Term: FW

Offering Faculty: Fac of Engineering Appl Sci

APSC 888 Engineering Innovation and Entrepreneurship Units: 3.00

This course will help learners from across engineering develop an entrepreneurial mindset capable of turning problems into opportunities. Learners will investigate the relationships between innovation and industrial dynamics, and seek to understand the fundamental forces that drive the science and technology industries' evolution and industry life cycles. EXCLUSION: CHEE 410

Offering Term: FW

Offering Faculty: Fac of Engineering Appl Sci



APSC 896 Engineering Leadership Units: 3.00

The course is designed to develop a range of leadership skills essential for engineering professional practice. Students will explore their own leadership abilities and develop their competencies in areas such as managing conflict, team dynamics and developing others. The course content will be presented through lectures, case studies, panel discussions and other active learning activities.

Offering Faculty: Fac of Engineering Appl Sci