

ENVR599 - Environmental Engineering (Electrical II) This electrical course will give Construction Technicians and Construction Technologists an understanding of electrical installation requirements and electrical terminology as it applies to the construction trades especially as it applies to commercial and industrial electrical installations.

LAWS601 - Law in Relation to Building This course is designed to give the student a working knowledge of the Canadian Legal system and of laws that have direct application to the construction industry. In particular the following topics are covered: The obtaining and enforcement of judgements; systems of land registration and processes regarding actual registration of land; the legal surveying of land; The Construction Lien Act; Arbitration, mediation, conciliation and alternate dispute resolution.

MATH109 - Mathematics Introduces the students to solving technical problems at a post-secondary level using the mathematical tools of measured data, fundamental algebra, trigonometric functions, radian measure, plane geometry and the solution of right-angled and oblique triangles.

MATH219 - Mathematics Continues with solutions of technical problems including the following topics: the mathematical tools involved in the solution of linear equations and variation problems; factoring, fractions and fractional equations; quadratic equations; exponents, logarithms and related equations.

MATH616 - Mathematics Reviews the fundamental arithmetic of percentages and covers the topics of simple and compound interest, annuities, amortization, sinking funds and depreciation. Also, covered in this course will be the fundamentals of descriptive statistics and introduction to probability.

MATS103 - Construction Materials The production, physical characteristics and application of construction materials will be studied. The course will include soils, concrete, steel and masonry products. Laboratory experiment for above materials will be conducted by students. Further materials discussed in the course are roofing materials, natural stone, adhesives, insulation materials, moisture and vapour barriers.

MATS203 - Construction Materials Students are introduced to the production, physical characteristics and application of various construction materials. The materials discussed are wood and timber products, ferrous and non-ferrous metals, glass and glazing systems, plastic, thermal and moisture protection products such as insulation types and roofing materials and acoustical materials. A laboratory experiment evaluating the properties of one selected material will be prepared by the student.

MATS219 - Mechanics of Materials Mechanics of Materials merges the principles of statics and the characteristics of materials from the first term to form the basis of structural design. It provides the student with the fundamentals of beam and column design. Stress, strain, properties of materials, shear force and bending moment, as well as simple beam and column design will be studied.

MGMT507 - Construction Management Students will examine the principles and techniques required to successfully manage the construction of a commercial/industrial building. Company/project organization structures, prime contracts, subcontracts, job site set up, insurance, bonding, materials handling, labour relations, sub trade co-ordination and shop drawings will be studied. Scheduling including CPM networks, Gantt charts, manpower allocation and cash flow projections will be reviewed.

MGMT607 - Construction Management Students will further examine construction management principles and techniques. Change notices, progress billings, inspections/testing, claims/disputes, cost controls and project close out procedures will be studied. Students will also be introduced to the "Harvard Project Manager" scheduling software package.

PSYC461 - Applied Psych for Technology Students Enables the student to develop a practical understanding of the principles of behaviour in the industrial working environment, and their differing responses to leadership, communication, organizational factors and pressures within the workplace.

QUAN104 - Quantity Surveying Students are introduced to the quantity

surveying of simple commercial, institutional, or industrial buildings on a level site. Included will be the application of principles and rules for take-off, calculation of areas and volumes, blueprint reading, measurement of concrete, and earth-works quantities.

QUAN202 - Quantity Surveying and Estimating Will prepare quantity surveys for residential and commercial projects. Quantities for concrete and formwork to foundations including stepped footings, column footings and pilasters will be studied as well as concrete and formwork quantities for columns, beams and suspended slabs. Takeoff of unit masonry construction and rough carpentry will be introduced.

QUAN312 - Quantity Surveying and Estimating Continues to develop the Construction Technology student's knowledge of quantity surveying and the various techniques involved in completing an accurate quantity survey of an industrial/commercial/ institutional type of building project typically seen in the construction industry today.

QUAN313 - Heavy Construction Quantity Surveying Introduces the quantity surveying of Civil structures. Included will be the application of principles and rules for takeoff, calculation of areas and volumes, and measuring quantities for Civil structures and designs such as retaining walls, concrete culverts, bridges and water treatment and supply for the following divisions - sitework and concrete. An introduction to material and equipment costing for sitework items will also be included.

QUAN400 - Quantity Surveying and Estimating Students will take-off and/or prepare unit price calculations for medium sized ICI sector projects. Included will be the application of principles and rules for take-off, calculation of areas and volumes, and measuring quantities for the following trade divisions of the master format; concrete, metals, thermal and moisture protection, and finishes. An introduction to material, labour, and equipment costing for division three items will also be included. A computer estimating program will be introduced.

QUAN504 - Quantity Surveying and Estimating Students will prepare a complete estimate for a medium size commercial or industrial building. Emphasis will be placed on quantity take-off and pricing in the following trade areas: concrete and formwork, masonry, metals and carpentry. In addition, pricing of project general expenses, estimate summarization and tender document preparation will be reviewed. Students will be introduced to the WINEST Estimating Software Package.

QUAN606 - Mechanical Estimating (Plumbing) Introduces the basics of mechanical estimating. It includes topics such as plumbing and/or hot water heating materials and pricing selection from a common trade source. Specific methodology is used to conform with trade related procedure.

QUAN607 - Mechanical Estimating (Hvac) Introduction to estimating of materials and labour for sheet metal work; roof flashings; duct systems for heating and ventilating systems. Specific estimating handbooks for mechanical contractors are used.

QUAN608 - Quantity Surveying and Estimating In this course, students will prepare a complete estimate for a large size commercial or industrial building. Emphasis will be placed on quantity take-off and pricing for all trade divisions, subtrade quotation review and analysis will be discussed. In addition, pricing of project general expenses, estimate summarization, and tender document preparation will be performed.

QUAN609 - Computer Estimating Students will prepare a computerized estimate using "Timberline" Estimating Software Package.

STAT105 - Statics Structural design is an integral component of the construction program. This fundamental structural theory course will provide the student with the basic knowledge and skills to determine and resolve loading conditions. Force applications, force transfer calculations, and the properties of cross-sectional shapes will be studied.

STRU300 - Structural Design Introduces the student of Construction Technology to the analysis and design of simple structures. A timber design manual will be used to develop the procedure for the design of beams,

columns and connections. A major design project will be completed which incorporates all the timber structural elements.

STRU408 - Structural Design Curriculum is under development

STRU500 - Structural Design The student will study the Ontario Building Code and its use in building construction and design also retaining wall structures and rigid frame structures will also be analyzed.

STRU603 - Structural Design This structural course considers masonry design and soils investigation. The student will apply current masonry design practices to various construction problems. Soil subgrade conditions, aggregate properties and uses, and testing will also be studied.

SURV102 - Construction Surveying Introduces basic surveying skills and techniques required for construction layout. Classroom instruction combined with practical field exercises will enable the student to become proficient in the use of surveying equipment for vertical and horizontal control of construction projects.

SURV212 - Construction Surveying Students will develop and draw topographical plans and cross sections in order to determine earthwork quantities. Using survey instruments and equipment, students will establish horizontal and vertical control for the erection of a building.

SURV612 - Construction Surveying Reviews the three basic plane surveying methods of measurement: chaining distances, angle measurement using theodolites, and elevation measurement using automatic levels. New theoretical material includes line direction, error and accuracy of closed traverse, coordinate geometry, layout of horizontal curves and setting of grades. Related field exercises will encompass review and new material.

Application Procedure

In order to apply for admission to this program an applicant must complete an "Application for Admission to Ontario Colleges of Applied Arts and Technology" form and submit this form to the:
Ontario College Application Service
P.O. Box 810, Guelph, Ontario, N1H 6M4
1-888-892-2228

Application Forms and Applicant Guidebooks are available at Ontario Secondary Schools, at Ontario Colleges of Applied Arts and Technology and at the Ontario College Application Service office.

Admission to the College

Complete information concerning admission to programs at Fanshawe College may be found in the Central Admission Publication located in Registrar and Student Awards Services, Fanshawe College.

The College reserves the right to make changes in the information in this brochure without prior notice.

The College reserves the right to cancel a program, a program major or option, or a course, and to change the location and term in which programs/courses are offered because of insufficient registrations or for other budgetary reasons.

This brochure is available in alternative formats, upon request, for persons with disabilities.

For further information on admission and registration, contact:
Registrar and Student Awards Services, (519) 452-4277

For further specific program information, contact:
Civil/Architectural Division, (519) 452-4414 or clliesser@fanshawec.on.ca

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Fanshawe

COLLEGE

Construction Engineering Technology (Management)



**FANSHAWE
COLLEGE**

*Community Driven . . .
Student Focused*

Construction Engineering Technology (Management)

A Co-Operative Education Program
A Three Year Diploma Program

Program Code: CMY1 Campus Code: LC September Admission

CONSTRUCTION OF INDUSTRIAL, COMMERCIAL, INSTITUTIONAL BUILDINGS: The program activities from planning to design to actual construction. Studies include construction methods, equipment, surveying, planning, scheduling, estimating, building economics, contracts and building law. The program interacts closely with the construction industry. Twelve months co-op work experience is part of this program.

Career Opportunities

Graduates have found employment with building developers, general contractors, land developers, Municipal, Provincial and Federal departments as superintendents, field co-ordinators, expeditors, quantity surveyors, estimators, inspectors, schedulers or contract managers. Many past graduates have started their own construction companies or have joined the family business.

Graduates of this program have direct transferability of at least 60 credits to the Bachelor of Science (Post-Diploma) degree program delivered by distance education through Athabasca University.

CMY11	Level 1	Hrs/Wk
CONS112	Construction Technology	4.0
COOP110	Co-Operative Education 1	1.0
CPTR141	Computer Operations (Basic)	2.0
ENVR298	Environmental Engineering—Plumbing	3.0
MATH109	Mathematics	3.0
MATS103	Construction Materials	3.0
QUAN104	Quantity Surveying	3.0
STAT105	Statics	3.0
SURV102	Construction Surveying	3.0

CMY12	Level 2	Hrs/Wk
CMNC155	Language and Communication Skills I	3.0
CONS212	Construction Technology	4.0
CPTR241	Computer Applications	2.0
ENVR299	Environmental Engineering (Electrical I)	2.0
MATH219	Mathematics	3.0
MATS203	Construction Materials	3.0
MATS219	Mechanics of Materials	3.0
QUAN202	Quantity Surveying and Estimating	4.0
SURV212	Construction Surveying	2.0

CMY13	Level 3	Hrs/Wk
CMNC255	Language and Communication Skills II	3.0
CONS300	Construction Technology	3.0
CONT302	Construction Contracts and Specifications	4.0
ENVR399	Environmental Engineering (Hvac)	2.0
QUAN312	Quantity Surveying and Estimating	4.0
QUAN313	Heavy Construction Quantity Surveying	4.0
STRU300	Structural Design	3.0

CMY14	Level 4	Hrs/Wk
CONC444	Construction Technology	2.0
CONS469	Building Science	2.0
CONT402	Construction Contracts and Specifications	4.0
ECON416	Building Economics	4.0
ENVR499	Environmental Engineering (Mechanical)	2.0
PSYC461	Applied Psych for Technology Students	3.0
QUAN400	Quantity Surveying and Estimating	5.0
STRU408	Structural Design	2.0

CMY15	Level 5	Hrs/Wk
CMNC355	Language and Communication Skills III	3.0
CONC555	Construction Equipment	1.0
ECON508	Building Economics	4.0
ENVR599	Environmental Engineering(Electrical II)	2.0
MGMT507	Construction Management	4.0
QUAN504	Quantity Surveying and Estimating	5.0
STRU500	Structural Design	3.0

CMY16	Level 6	Hrs/Wk
CONS246	Health and Safety	3.0
LAWS601	Law in Relation to Building	2.0
MATH616	Mathematics	3.0
MGMT607	Construction Management	4.0
QUAN606	Mechanical Estimating (Plumbing)	2.0
QUAN607	Mechanical Estimating (Hvac)	2.0
QUAN608	Quantity Surveying and Estimating	3.0
QUAN609	Computer Estimating	1.0
STRU603	Structural Design	2.0
SURV612	Construction Surveying	2.0

Program Eligibility Criteria Required Academic Preparation

OSSD with courses at the General Level with:

- Grade 12 English
- Mathematics * ONE OF:
 - Grade 12 Mathematics for Technology
 - Grade 12 Mathematics, Advanced (preferred)
 - OAC Finite Mathematics

Or

BTSD-Level 4 Certificate

Or

Pre-Technology Certificate **

Or

Ontario High School Equivalency Certificate (GED) and:

- Mathematics * ONE OF:
 - Grade 12 Mathematics for Technology
 - Grade 12 Mathematics, Advanced (preferred)
 - OAC Finite Mathematics

Or

Mature Applicant with standing in the required courses stated above

Note: Applicants who lack required courses may be admitted to the program subject to appropriate prior upgrading.

Recommended Academic Preparation

- Grade 12 Mathematics, Advanced
- Grade 11 or Grade 12 Science, Advanced
- Grade 12 English, Advanced
- Grade 11 or Grade 12 Construction Technology
- Keyboarding

Recommended Personal Preparation

Summer employment in construction or related activity.

Applicant Selection Criteria

Where the number of eligible applicants exceeds the available spaces in the program, the Applicant Selection Criteria will be:

- A. Preference for Permanent Residents of Ontario.
- B. Receipt of Application by February 1st.
- C. Achievement in the required academic preparation.
- D. Achievement in the recommended academic preparation.

Notes:

- *Mathematics to include Algebra, Geometry, Trigonometry.
- **Students admitted to the Pre-Technology program are guaranteed admission the following year to a School of Technology career program (excluding the programs in the Information Technology Division) provided

that they achieve a 'B' average in the Pre-Technology program and fulfill any other specified conditions. Normally these students are admitted to their first choice career program.

Advanced Standing

Credit for any course in the program will be given to students who can demonstrate that they have the required skills to meet the objectives of the course.

Approximate Costs (1999/2000)

Fees for:	Levels 1 & 2	Levels 3 & 4	Levels 5 & 6
	\$2390.30	\$2390.30	\$2390.30
Books and Supplies:	\$1474.00	\$ 717.00	\$ 906.00

Course Descriptions

CMNC155 - Language and Communication Skills I Students are given the opportunity to establish skills in reading, writing and editing documents for work-related and personal uses. Students will also practice important study/reading skills and apply grammar rules.

CMNC255 - Language and Communication Skills II Provides the student with the skills and knowledge required to formulate and articulate his or her responses to literature, with emphasis upon the analysis of audience, purpose, message, and prose texts.

CMNC355 - Language and Communication Skills III Students will perform primary and secondary research, to shape, organize and document a formal report and to present a persuasive oral report.

CONC444 - Construction Technology Introduce students to certain aspects of heavy construction including the reinforcing of concrete structures, how reinforcing steel is detailed, tagged, shipped and delivered to the jobsite as well as the placement and operation of vertical lift equipment as related to heavy construction operations.

CONC555 - Construction Equipment Students will study the use of heavy equipment as required on a construction job site. This course will provide students with the knowledge and skills on how to buy or rent equipment; determine owning and operating cost; select proper equipment and various attachments, and to calculate production and unit costs.

CONS112 - Construction Technology Provides the student with the general knowledge and skills required to build and/or supervise the construction of small and intermediate size buildings. Construction methods as they relate to building foundations, structural frames of masonry and wood, as well as interior and exterior finishes of buildings, will be investigated.

CONS212 - Construction Technology This 56 hour survey course will provide students with the general knowledge and basic skills required for the advanced courses in the construction engineering technology program. Construction methods as they relate to steel frame construction, placing and handling of concrete, formwork for site cast concrete, precast concrete structures, roofing, exterior and interior finishing will be investigated.

CONS246 - Health and Safety Student will examine the issue of safety for construction projects in the Province of Ontario. This course will also provide the student with the knowledge and skills necessary to administer effective First Aid in a emergency reartificial respiration techniques, splinting, transportation procedures, haemorrhage control, breathing and heart emergencies (CPR). The Workplace Hazardous Materials Information System (WHMIS) program will be reviewed in detail.

CONS300 - Construction Technology This 42 hour course builds on what was learned in CONS 112 and 212. The student will investigate the properties of formwork materials and the selection of formwork for horizontal and vertical concrete surfaces. The use of flying forms for multi-storey buildings, slipform construction for horizontal and vertical operations as well as typical formwork for precast concrete units will be investigated.

CONS469 - Building Science Students examine current Building Science issues and concerns. Topics include air barriers, vapour barriers, building envelope design and installation, sound transmission and attenuation, heat flow and transfer, radon detection and control, corrosion and protection of metals, fire ratings, sick building syndrome, testing and sampling procedures will be reviewed as well as the establishment of codes and standards.

CONT302 - Construction Contracts and Specifications Provides the student with an understanding of the elements required to create a valid contract as well as an appreciation of the elements required to make a valid contract legally enforceable. The course will also provide the student with a comprehensive understanding of the tendering process and an appreciation of the importance of construction specifications to the construction process.

CONT402 - Construction Contracts and Specifications Introduce the student of Construction Technology to various types of construction contracts, thus finalizing the process covered in CONT302. The student will examine, interpret and analyze numerous construction contract documents. The student will understand the roles of the various parties to a construction contract, and in each case, the parties' rights and obligations under various contractual arrangements.

COOP110 - Co-Operative Education 1 Provides an opportunity for the student to develop personal, educational and career goals and plans. The student will gain a broader perspective of the changing nature of the workplace and the relationship of work to the individual and to society and in the process, will develop skills in the preparation of job resumes, job search strategies and tools, interview techniques and job performance evaluations.

CPTR141 - Computer Operations (Basic) Computers are an integral part of the construction industry. This course will provide the student with the knowledge and skills to create communication documents using a word processor. Writing reports and newsletters, working with templates, and creating tables and charts will be studied.

CPTR241 - Computer Applications Construction estimating software is a combination of spreadsheet and database technology. This course will provide the student with the basic skills to use electronic spreadsheets. Efficient use of spreadsheets, charts, and databases will also be studied.

ECON416 - Building Economics The design and construction of buildings does not occur without considering feasibility and investment aspects. This course will provide the student with the fundamentals of real estate transactions, finances, property rights, and investment analysis. Title searches, the legal system, mortgage calculations, and budget estimates will also be studied.

ECON508 - Building Economics Provides the student with the skills and tools required to forecast the cost and develop budgets for building development and construction as various phases of preliminary design.

ENVR298 - Environmental Engineering—Plumbing The construction technologist must be able to work effectively with all of the trades on a construction project. This introductory level course will provide a basic understanding of ICI (Industrial, Commercial, and Institutional) and residential plumbing systems.

ENVR299 - Environmental Engineering (Electrical I) This electrical course will give Construction Technicians and Construction Technologists a basic understanding of electrical installation requirements and electrical terminology as it applies to the construction trades.

ENVR399 - Environmental Engineering (Hvac) The construction technologist must be able to work effectively with all of the trades on a construction project. This introductory level course will provide a basic understanding of ICI (Industrial, Commercial, and Institutional) H.V.A.C. systems.

ENVR499 - Environmental Engineering (Mechanical) This mechanical course will provide an understanding of design and installation of the mechanical systems in residential projects.