ARCHITECTURAL TECHNOLOGY

Program Outline

Major: ARTE
Length: 3 Years
Delivery: 6 Semesters, plus 3 work terms
Credential: Ontario College Advanced Diploma, Co-op
Effective: 2016-2017
Location: Barrie
Start: Fall (Barrie)

Description
This program is a three-year co-operative education program with 6 academic semesters and 3 co-op work terms. It prepares graduate technologists to work with architects, engineers, designers and project managers as an integral part of the team developing, presenting and executing of building designs. The program equips a student with comprehensive understanding of current competitive architectural / construction environments that challenge professionals in the field, including mastering the latest codes and standards, site management techniques and computer technologies.

Career Opportunities
Graduates find work in the private sector as estimators, purchasers, quantity surveyors or architectural / structural drafters or detailers, using the latest in CAD technology. They may also find employment as assistants in architectural design offices or in construction field offices. In the public sector, they may find employment in many government agencies, or as building inspectors / code enforcement officials.

Program Learning Outcomes
The graduate has reliably demonstrated the ability to:

- communicate with clients, contractors, other building professionals, and approval authorities;

- prepare, read, interpret, and revise drawings, and other graphical representations used in building projects;
- obtain, analyze, prepare, and revise specifications and other project documents used in design and construction;
- prepare estimates of time, costs, and quantity, and participate in the tendering process;
- solve technical problems related to building projects through the application of principles of building science and mathematics;
- collaborate with and coordinate information from structural, mechanical, and electrical building systems professionals;
- contribute to the design of architectural projects;
- contribute to the analysis, planning, and preparation of site planning documents;
- comply with the legal and ethical requirements of an architectural technologist in the practice of building design and construction;
- assess buildings and their interiors, and make recommendations for their repurposing and renovation;
- ensure personal safety and contribute to the safety of others in the workplace;
- participate in sustainable design and building practices;
- use and evaluate current and emerging technology to support building projects;
- assist in the planning, scheduling, and monitoring of building projects;
- apply business principles to design and building practices;
- apply basic entrepreneurial strategies to identify and respond to new opportunities.

Practical Experience:
Co-operative Education is a mandatory component of all Co-op programs at Georgian College; it has been designed as a process by which students integrate their academic education with work experience related to their programs of study. This integration affects much more than simply earning a salary, including the adjustment to the work environment and the development of professionalism. It also reinforces skills and theory learned during academic semesters, develops professional contacts, job knowledge and career path, improves human relations and communication skills, and promotes personal maturity and financial independence.

Students are requested to register, attend and participate in their scheduled co-operative education classes. These classes are scheduled for all first year students and are expected to be completed in order for students to proceed successfully to their first co-op work experiences. To ensure students are eligible to proceed onto any co-op work experience, students should refer to Promotional Status and Eligibility for Co-op as outlined in the College Calendar. Co-op policies and procedures can be located on our website: www.georgiancollege.ca/student-services/co-op-and-career-services/students-tab/

Georgian College follows the Co-operative Education guidelines set out by the Canadian Association for Co-operative Education (CAFCE) and Education at Work Ontario

(EWO) by supporting the learning outcomes designed for the program specific graduate profile and curriculum as set out by the Ministry of Training, Colleges and Universities.

The Program Progression:

Fall Intake - Barrie

Sem 1	Sem 2	Work Term 1	Sem 3	Work Term 2	Sem 4
Fall 2016	Winter 2017	Summer 2017	Fall 2017	Winter 2018	Summer 2018

Work Term 3	Sem 5	Sem 6
Fall 2018	Winter 2019	Summer 2019

Articulation:

A number of articulation agreements have been negotiated with universities and other institutions across Canada, North America and internationally. These agreements are assessed, revised and updated on a regular basis. Please contact the program co-ordinator for specific details if you are interested in pursuing such an option. Additional information can be found on our website at http://www.georgiancollege.ca/admissions/credit-transfer/

Admission Requirements:

OSSD or equivalent with
- Grade 12 English (C or U)
- Grade 12 Mathematics (C or U)

Mature students, non-secondary school applicants (19 years or older), and home school applicants may also be considered for admission. Eligibility may be met by applicants who have taken equivalent courses, upgrading, completed their GED, and equivalency testing. For complete details refer to: www.georgiancollege.ca/admissions/policies-procedures/

Applicants who have taken courses from a recognized and accredited post-secondary institution and/or have relevant life/learning experience may also be considered for admission; refer to the Credit Transfer Centre website for details: www.georgiancollege.ca/admissions/credit-transfer/

Graduation Requirements:

43 Mandatory Courses
2 Communications Courses
3 General Education Courses
3 Co-op Work Terms

Graduation Eligibility:

To graduate from this program, the passing weighted average for promotion through each semester, from year to year, and to graduate is 60%. Additionally, a student must attain a minimum of 50% or a letter grade of P (Pass) or S (Satisfactory) in each course in each semester unless otherwise stated on the course outline.

Mandatory Courses

ACCT3006 Construction Accounting
ARCH1000 Architectural Design - Fundamentals
ARCH1001 Quantity Surveying 1
ARCH1002 Architectural Design - Residential
ARCH1003 Quantity Surveying 2
ARCH1005 Architectural Drafting 1
ARCH1006 Architectural Drafting 2
ARCH1007 Drawing for Architecture
ARCH2000 Architectural Design - Commercial
ARCH2002 Architectural Codes and Standards 1
ARCH2003 History of Architecture
ARCH2004 Architectural Drafting 3
ARCH2005 Architectural Codes and Standards 2
ARCH2006 Sustainable Design
ARCH2007 Architectural CAD
ARCH3000 Architectural Project 1
ARCH3001 Architectural Project 2
BLDG2000 Ontario Building Code and Provincial Standards
BLDG3000 Legal Processes and Responsibilities in the Ontario Building Code Act
CONS1005 Construction Technology: Structures
CONS1006 Construction Technology: Interiors
CONS2005 Construction Technology: Building Envelope
CONS2006 Building and Materials Reuse
CONS2007 Site Planning and Landscape
CONS3000 Structural Analysis: Beams and Columns
CONS3002 Introduction to Building Information Modeling

CONS3003 Structural Analysis: Design
CONS3004 Advanced Building Information Modeling
CONS3005 Building Services
CONS3009 Municipal Services
CONS3010 Occupational Health and Safety Act Regulations
CONS3011 Construction Materials
ENTR1002 Introduction to Entrepreneurship
ENVR1008 Architecture and the Environment
MATH1028 Mathematics for Constructions
MENG2016 Statics
MENG2017 Strength of Materials
MGMT1002 Productivity Tools
MGMT2025 Project Management
MGMT3006 Contract Law: Bid Tender Process
MGMT3011 Business Management
MGMT3012 Site Management and Specifications
SURV1002 Surveying

Communications Courses
To be selected at time of registration from the College list, as determined by testing.

General Education Courses
To be selected from College list

Co-op Work Terms
COOP1013 Technology Work Term 1
COOP2009 Technology Work Term 2
COOP3005 Technology Work Term 3

Course Descriptions:
ACCT3006 Construction Accounting 42.0 Hours
This course provides an introduction to accounting and its applications in the construction industry. Included are financial statement presentations and preparations of the required entries.

ARCH1000 Architectural Design - Fundamentals 42.0 Hours
This course addresses architectural design and the theory supporting this activity. Its purpose is to convey the principles, logic and dependencies of the design process between project inception and completion. The course presents also the specific

representations used in architectural design and various techniques for design presentation at different project development stages.

ARCH1001 Quantity Surveying 1 42.0 Hours
This course presents the role of estimating in architecture and the construction industry, a review of the various types of estimates used within the industry and an overview of the responsibilities involved. Information presented in this course provides students with the skills necessary to define an estimate recognizing the standards of the industry. Material take off procedures will be demonstrated and applied using examples based on various construction materials and processes.

ARCH1002 Architectural Design - Residential 42.0 Hours
Architectural and structural design related to residential programs is covered in this course. The student develops designs and learns to recognize and interpret a designer's intent. The student also develops knowledge of construction components, basic building code requirements, and local by-laws.
P- ARCH1000 Architectural Design - Fundamentals

ARCH1003 Quantity Surveying 2 42.0 Hours
Presented in this course are the fundamentals of quantity surveying, employing methodology from the Canadian Institute of Quantity Surveyors, (CIQS) Method of Measurement and Industry Practice. Material take off procedures will be demonstrated and applied using examples from wood framed structures.
P- ARCH1001 Quantity Surveying 1

ARCH1005 Architectural Drafting 1 42.0 Hours
This course introduces the student to computer applications used in architectural design. This first level CAD course provides support to other design related courses where computerized drafting is required for completing specific assignments.

ARCH1006 Architectural Drafting 2 42.0 Hours
This course builds upon the basic computer drafting techniques introduced in the previous level. Additional exposure to Computer Assisted Design promotes productiveness and accuracy within the design process through the use of intermediate drafting technique.
P- ARCH1005 Architectural Drafting 1

ARCH1007 Drawing for Architecture 42.0 Hours
This course is preparing the students to learn, practice and improve their skills in sketching, free-hand drawing and basic rendering, as these are important channels of visual communications in the industry.

ARCH2000 Architectural Design - Commercial 42.0 Hours

In this course, students will design a medium sized commercial building using non-combustible materials. Logical progressive steps and specific design requirements will result in a complete set of construction drawings that fulfills most of the requirements of the client.
P- ARCH1000 Architectural Design - Fundamentals

ARCH2002 Architectural Codes and Standards 1 42.0 Hours
This course starts with a basic overview of the current set-up, structure, content and application of the requirements of Ontario Building Code using both Volumes 1 and Volume 2 to assist the user with the knowledge of the necessity of the current requirements. The focus of this course will be on the current Building Code requirements dealing with houses specifically on Part 9.

ARCH2003 History of Architecture 42.0 Hours
This course provides students with an introduction to the field of architecture, the history of the profession in Canada and the development of the current practices in Ontario. This course also provides an overview of the role of architects, engineers, trades and the general field of design.

ARCH2004 Architectural Drafting 3 42.0 Hours
This course builds upon the computer drafting skills acquired in previous levels. Advanced techniques in Computer Assisted Design will be presented for efficient and accurate representation of design projects.
P- ARCH1005 Architectural Drafting 1

ARCH2005 Architectural Codes and Standards 2 42.0 Hours
This course covers the advanced sections in Part 9 of the Ontario Building Code and other Parts of the OBC that are referenced in Part 9, including Parts 3 and Part 4, that apply to houses and small buildings. This course is also based on the Small Building requirements to prepare for the BCIN qualification exams in that category as required by the Building and Development Branch of the Ministry of Municipal Affairs and Housing.
P- ARCH2002 Architectural Codes and Standards 1

ARCH2006 Sustainable Design 42.0 Hours
This course elaborates the fundamental principles of sustainability in architectural design, discussing about materials, processes and technologies that can provide a more sustainable life of the architectural product.

ARCH2007 Architectural CAD 42.0 Hours
This course is the venue for the transition from two-dimensional drafting to three-dimensional modeling in architectural design. The concepts of modeling and simulations are presented as well.
P- ARCH2004 Architectural Drafting 3

ARCH3000 Architectural Project 1 42.0 Hours
Students will develop a project for an O.B.C. Part 9 building. The design will include such topics as project programming, research, functionality, aesthetics, structural design, site analysis, code review, and determination of appropriate materials/methods of construction.
P- MGMT2025 Project Management

ARCH3001 Architectural Project 2 42.0 Hours
Students will continue to develop and complete the project started in the previous course. The course will include the complete hard-copy drawing set and a public presentation.
P- ARCH3000 Architectural Project 1

BLDG2000 Ontario Building Code and Provincial Standards 42.0 Hours
This course provides advanced knowledge of the object, structure, contents and application of Part 3 of the Ontario Building Code, (O.B.C.), specifically as it pertains to large buildings. Also included is exposure to the infrastructure standards and requirements of the Ontario Provincial standards and to the standards writing organizations in Canada and internationally as they impact building design and construction.

BLDG3000 Legal Processes and Responsibilities in the Ontario Building Code Act 42.0 Hours
This course provides the required knowledge of the processes and responsibilities as set out the Building Code Act for all Building Code practitioners who are involved in the design, construction, and inspection of buildings in the province of Ontario.

CONS1005 Construction Technology: Structures 42.0 Hours
This course studies the typical solutions, materials and methods commonly used in architectural design for structural elements and systems. Students will independently research on various topics related to structural materials.

CONS1006 Construction Technology: Interiors 42.0 Hours
This course elaborates on the architectural solutions and construction materials and processes used to design and build the interior of a building. Students will independently research on various topics related to interiors materials.

CONS2005 Construction Technology: Building Envelope 42.0 Hours
The course covers construction materials and systems used to enclose a building. Constructive solutions, details, applications and examples are included in this subject. Students will independently research on various topics related to building envelope materials.

CONS2006 Building and Materials Reuse 42.0 Hours
The course elaborates on the options, methods and processes used to preserve, remodel, re-purpose or decommission a building. Students will be introduced to the analysis process required for LEED compliance.

CONS2007 Site Planning and Landscape 42.0 Hours
This course introduces the students to zoning, municipal standards and site planning. Site grading, hard surfaces, landscaping, and drainage will also be investigated.

CONS3000 Structural Analysis: Beams and Columns 42.0 Hours
This course incorporates the study of beam analysis and design in various materials, further investigation of combined stresses and the introduction of column design and indeterminate beams.
P- MENG2007 Strength of Materials

CONS3002 Introduction to Building Information Modeling 42.0 Hours
This course will introduce the student to computerized modeling for architectural projects. Skills in the use of software and industry practices will be applied to a small residential or commercial project.
P- ARCH1003 Quantity Surveying 2 and P- ARCH2000 Architectural Design - Commercial

CONS3003 Structural Analysis: Design 42.0 Hours
This course focuses on the study of loads, design and materials. Overall design concepts are explored for such structures as retaining walls, bridges and different building types and their uses.
P- CONS3000 Structural Analysis: Beams and Columns

CONS3004 Advanced Building Information Modeling 42.0 Hours
In this course students will further develop the project development skills introduced in the previous course. Advanced modeling techniques will be used to complete the architectural project started in the previous semester.
P- CONS3002 Introduction to Building Information Modeling

CONS3005 Building Services 42.0 Hours
Emphasized in this course are the design and draw systems within a building based on the study of HVAC, plumbing and electrical requirements. This study is based on applicable code requirements in Ontario.

CONS3009 Municipal Services 42.0 Hours
This course focuses on the design and installation of municipal services. The main topics include piping materials, sewer and water main appurtenances, structural and hydraulic loads, and storm water management and sanitary drainage systems.

CONS3010 Occupational Health and Safety Act Regulations 42.0 Hours

Students will be introduced to provincial laws, WHIMS, construction site safety, hazardous materials in existing structures and other design-related safety issues. Regulations controlled by authorities having jurisdiction will also be presented.

CONS3011 Construction Materials 42.0 Hours
The course presents the use, specifications, quality standards and testing procedures for soils and various construction materials. Students will be exposed to practical material testing in the lab and in the field.

COOP1013 Technology Work Term 1 640.0 Hours
Co-operative Education will provide students with the skills to conduct a college directed and self directed job search in their chosen field of study. Students will obtain a co-op work experience with an employer for a period of 14 weeks. All students are responsible to submit a work term report indicating achievement of specific learning outcomes during their 1st co-op work term. Georgian College follows the Co-operative Education guidelines set out by the Canadian Association for Co-operative Education (CAFCE) and Education at Work Ontario (EWO) by supporting the learning outcomes designed for each program.

COOP2009 Technology Work Term 2 560.0 Hours
Co-operative Education will allow students to gain new/enhanced technical work experience. As students begin to recognize their chosen academic strengths and career direction, they will be better prepared to choose their academic courses and professional options. All students are responsible for submitting a work term report and employer evaluation form following this work term. It is expected that a student wishing to return to their Work Term 1 employer, be asked to seek new/more in depth responsibilities so that enhancement of program specific learning outcomes be achieved.
P- COOP1013 Technology Work Term 1

COOP3005 Technology Work Term 3 560.0 Hours
Co-operative Education will allow students to gain further technical work experience. As students realize their chosen academic strengths and career direction, they will be better able to choose their academic courses and professional options. All students are required to submit a work term report and employer evaluation form following this work term. It is expected that a student wishing to return to a Work Term 1 or Work Term 2 employer, be asked to seek new/more in depth responsibilities so that enhancement of program specific learning outcomes will be achieved.
P- COOP2009 Technology Work Term 2

ENTR1002 Introduction to Entrepreneurship 42.0 Hours
This course is designed to help students evaluate the business skills and commitment necessary to successfully operate an entrepreneurial venture and review the challenges and rewards of entrepreneurship. Students will learn about themselves, their decisions,

and their goals to determine how entrepreneurship can play a role in their lives. Students will also be introduced to entrepreneurship from an economic perspective and the concepts of environmentally sustainable practices and social entrepreneurship.

ENVR1008 Architecture and the Environment 42.0 Hours
The course presents criteria for an environmental design, relationships between the environment and buildings, the construction processes and materials, the operating aspects and the options for the end-of-life of a structure.

MATH1028 Mathematics for Constructions 42.0 Hours
This course provides a foundation in mathematics subjects related to architectural and construction applications. Students will develop skills in mathematical thinking and problem solving, by employing the use of algebra, trigonometry and two- and three-dimensional geometry.

MENG2016 Statics 42.0 Hours
This course is an introduction to the equilibrium of externally applied forces and internally developed reaction forces as applied to construction structures.

MENG2017 Strength of Materials 42.0 Hours
This course is designed to familiarize the student with some basic concepts of strength of materials, particularly direct stress and strain, bending and torsional stresses.
P- MENG2016 Statics

MGMT1002 Productivity Tools 42.0 Hours
This course introduces strategies, methods and tools for analyzing, organizing, and presenting information in a business environment. Students will learn about research methods, data processing, document editing, time management and presentation techniques required for an efficient professional performance.

MGMT2025 Project Management 42.0 Hours
This course introduces the fundamental principles necessary for successful management of projects. Project planning, management and control techniques will be discussed and the application of computers in project management will be studied.

MGMT3006 Contract Law: Bid Tender Process 42.0 Hours
This course introduces specifications and contract building law, including analysis of Construction Law as it relates to the construction process. Legal issues that arise in the bidding process and contract administration are discussed. This is a comprehensive look at the construction industry and value of construction contracts from a practical non-legal framework.

MGMT3011 Business Management 42.0 Hours

This course presents fundamental principles for operating a design practice or construction business. Emphasis is placed on good business practices and professional ethics.

MGMT3012 Site Management and Specifications 42.0 Hours
In this course, students are introduced to managing construction projects and to generation and application of construction specifications.

SURV1002 Surveying 42.0 Hours
This is an introductory course to the principles of surveying as related to the construction industry. Emphasis is placed on obtaining field skills in linear measurement and the operation of levels, transits, theodolites and electronic surveying equipment. Basic traverse computation and other office calculations that use the collected field data are practiced.

Course Description Legend
P = Prerequisite; C = Concurrent prerequisite; CO= Corequisite

Information contained in College documents respecting programs is correct at the time of publication. Academic content of programs and courses is revised on an ongoing basis to ensure relevance to changing educational objectives and employment market needs. The college reserves the right to add or delete programs, options, courses, timetables or campus locations subject to sufficient enrolment, and the availability of courses.