

Course Outline

1. COURSE INFORMATION

Session Offered	Fall 2017		
Course Name	C++ Programming		
Course Code	ENG TECH 1CP3		
Date(s) and Time(s) of lectures	C01	Mo	09:30 - 11:20 ETB/234
	L01	We	08:30 - 10:20 ETB/B104
	C02	Mo	12:30 - 14:20 ETB/234
	L02	We	13:30 - 15:20 ETB/B104
	C03	Mo	14:30 - 16:20 ETB/234
	L03	Th	14:30 - 16:20 ETB/234
	C04	Mo	16:30 - 18:20 ETB/B104
	L04	We	16:30 - 18:20 ETB/B104
	C05	Tu	08:30 - 10:20 ETB/B104
	L05	Th	09:30 - 11:20 ETB/B104
	C06	Tu	10:30 - 12:20 ETB/B104
	L06	Fr	12:30 - 14:20 ETB/B104
Program Name	Automotive and Vehicle Technology / Biotechnology / Process Automation Technology		
Calendar Description	Programming concepts and introduction to C++ programming. C++ syntax, functions, decision-making, looping, operators, arrays and data structures.		
Instructor(s)	Nasim Muhammad (nasimm@mcmaster.ca) Mark Yendt (yendtm@mcmaster.ca) Sharon Scollard (sharon.scollard@mohawkcollege.ca) Khalil Abuosba (abuosbak@mcmaster.ca)		Office Hours & Location:

2. COURSE SPECIFICS

Course Description	The course introduces the fundamentals of computer programming using the C++ language. The content of the course include basic concepts like decisions making, looping, functions, strings and arrays, as well as data structures and disc operations. The purposes of the course is to develop students' skills in programming and problem solving, to provide students with the tools needed for writing C++ programs to solve engineering problems, and to offer a foundation for courses that require programming skills.		
Instruction Type	Code	Type	Hours per term
	C	Classroom instruction	24
	L	Laboratory, workshop or fieldwork	24
	T	Tutorial	
	DE	Distance education	
	Total Hours		48
Resources	ISBN	Textbook Title & Edition	Author & Publisher
	ISBN: Custom – 9781256822363	Pearson Custom Computer Science ENG TECH 1CP3 & COMP TECH 3PD3	Gaddis, Tony Addison-Wesley
	7 th - 978-0132576253	Starting out with C++:	

		from control structures through objects, 7th Ed	
	Other Supplies	Source	
Prerequisite(s)	Registration in Automotive and Vehicle Technology / Biotechnology / Process Automation Technology		
Corequisite(s)			
Antirequisite(s)	COMP TECH 3PD3, ENG TECH 1PG3, 1SP3		
Course Specific Policies	<ul style="list-style-type: none"> • Students are expected to attend all lab sessions, and to complete and submit all lab work and assignment exercises. • Assignments and lab reports will be submitted through Avenue as per posted due dates. A submission after the deadline or by e-mail will not be considered for marking or review. • Students must attend the lab as specified by the instructor in order to receive a grade for the lab assignment. • All tests/Labs/Assignments marks will be posted on Avenue. It is your responsibility to report any discrepancies to your instructor before the last day of classes. No errors will be corrected unless reported by this time. • No previous programming experience is required for enrolling in this course <p>Missed Work Policy for Tests: You are required to submit MSAF for missing test(s); otherwise ZERO will be assigned to the grade. After receiving your MSAF:</p> <ul style="list-style-type: none"> • First MSAF: The weight of the missing test will be added to the final. • Second MSAF: A make-up test will be provided for the 2nd missing test. 		
Departmental Policies	<p>Students must maintain a GPA of 3.5/12 to continue in the program.</p> <p>In order to achieve the required learning objectives, on average, B.Tech. students can expect to do at least 3 hours of “out-of-class” work for every scheduled hour in class. “Out-of-class” work includes reading, research, assignments and preparation for tests and examinations.</p> <p>Where group work is indicated in the course outline, such collaborative work is mandatory.</p> <p>The use of cell phones, iPods, laptops and other personal electronic devices are prohibited from the classroom during the class time, unless the instructor makes an explicit exception.</p> <p>Announcements made in class or placed on Avenue are considered to have been communicated to all students including those individuals that are not in class.</p> <p>Instructor has the right to submit work to software to identify plagiarism.</p>		
3. SUB TOPIC(S)			
Week 1 (Sept 5 – 8)	Intro to programming and C/C++ primitive data types, string object, variables (naming conventions), constant, type cast, arithmetic operators, unary operators, compound operators (+=, -=, *=, /=, %=), integer division, output to console, input from keyboard, comments		Chapter 1-3

Week 2 (Sept 11 – 15)	Decision structures if, if/else, if/else if/else, switch, nested control structures, relational operators, Boolean logic, random number generator, C++ library functions (pow, abs, cos, exp, sin, sqrt, tan, acos, asin, atan, fmax, fmin), formatting output	Chapter 3
Week 3 (Sept 18 – 22)	Loops and files reading input from a file, (no output to a file), while, do/while, for loop, counters, sentinel, data validation (pre-test and post-test), flags, nested control structures.	Chapter 4
Week 4 (Sept 25 – 29)	Intro to Functions Defining and calling a function, prototype, pass by value, return using return statement, local and global variables, scope	Chapter 6
Week 5 (Oct 02 – 06)	Term Test 1 (review and test) Text Chapters: 1 – 4 <u>Topics:</u> primitive data types, string object, variables (naming conventions), constant, type cast, arithmetic operators, unary operators, compound operators (+=, -=, *=, /=, %=), integer division, output to console, input from keyboard, comments if, if/else, if/else if/else, switch, nested control structures, relational operators, Boolean logic, random number generator, C++ library functions, formatting output reading input from a file, (no output to a file), while, do/while, for loop, counters, sentinel, data validation (pre-test and post-test), flags, nested control structures.	
Mid-term Recess: Monday, October 9 to Sunday, October 15, 2017		
Week 6 (Oct 16 – 20)	Functions Reinforcement, more examples Defining and calling a function, prototype, pass by value (no pass by ref), return using return statement, local and global variables, scope	Chapter 9
Week 7 (Oct 23 – 27)	Functions – pointers address of a variable, initializing pointers, passing pointers as parameters in a function (no pass by ref), scope	Chapter 7
Week 8 (Oct 30 – Nov 03)	Numerically indexed arrays	

	single dimensional arrays, populating an array (hard code, from keyboard and from a file), outputting an array, 2D array, pass array as a parameter in a function, introduce C-string (Char array)	
Week 9 (Nov 06 – 10)	<p>Term Test 2 (Functions) Text Chapters: 5, 9</p> <p><u>Emphasis on:</u> Defining and calling a function, prototype, pass by value, return using return statement, local and global variables, scope</p> <p>address of a variable, initializing pointers, passing pointers as parameters in a function (no pass by ref)</p>	Chapter 10
Week 10 (Nov 13 – 17)	<p>C-Strings</p> <p>Library functions isalpha, isalnum, isdigit, islower, isprint, ispunct, isupper, isspace, toupper, tolower, strcpy, strcat, atoi, atof</p>	Chapter 11
Week 11 (Nov 20 – 24)	<p>Data Structures</p> <p>Abstract data types, structure declarations, accessing structure members, arrays of structures, passing structures as parameters in a function</p>	Chapter 12
Week 12 (Nov 27 – Dec 01)	<p>File I/O</p> <p>Reading data from a file into a structure, writing to a file, appending to a file, opening a file for both input and output</p>	
Week 13 (Dec 04 – Dec 06)	Review (if time permits)	
<p>Classes end: Wednesday, December 6, 2017 Final examination period: Friday, December 8 to Thursday, December 21, 2017 All examinations MUST be written during the scheduled examination period.</p>		
List of experiments		
Lab 1	Introduction to Computers and Programming / Decision Structures	
Lab 2	Looping	
Assignment 1	Review Decision Structures and Looping	
Lab 3	Functions	
Lab 4	Pointers	
Assignment 2	Review Functions	
Lab 5	Arrays	
Lab 6	C-Strings	
Lab 7	Data Structures	
Assignment 3	File I/O	
Note that this structure represents a plan and is subject to adjustment term by term.		

The instructor and the University reserve the right to modify elements of the course during the term. The University may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes.

4. ASSESSMENT OF LEARNING *including dates*	Weight
7 Lab reports	10%
3 Assignments	10%
2 Term-tests (1x20% + 1x25%)	45%
Final exam	35%
TOTAL	100%

Percentage grades will be converted to letter grades and grade points per the University calendar.

5. LEARNING OUTCOMES

1. Identify the differences between C++ basic data types, select types appropriate to a purpose and select correct and appropriate C++ identifier names
2. Construct and use functions. Write correct function prototypes, definitions, and calls to the functions. Select the appropriate method to pass values or references. Differentiate between void and valued functions. Identify the scope of automatic, static and global variables.
3. Use correctly input/output methods for different data types and formats
4. Properly use of *if*, *if...else* and *switch* decision making operators
5. Select the appropriate type and implement the looping mechanisms *for*, *while*, and *do...while*
6. Declare, initialize, and manipulate one-dimensional and two-dimensional arrays. Use arrays as function parameters.

6. POLICIES

Anti-Discrimination

The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer or the Human Rights Consultant, as soon as possible.

http://www.mcmaster.ca/policy/General/HR/Discrimination_Harassment_Sexual_Harassment-Prevention&Response.pdf

Academic Integrity

You are required to exhibit honestly and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, located at: <http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf>.

The following illustrates only three forms of academic dishonesty:

1. Plagiarism. E.g. the submission of work that is not own or for which other credit has been obtained
2. Improper collaboration in group work
3. Copying or using unauthorized aids in tests and examinations.

Requests for Relief for Missed Academic Term Work (Assignments, Mid-Terms, etc.)

The McMaster Student Absence Form is an on-line self-reporting tool for Undergraduate Students to report absences for:

- 1) Relief for missed academic work worth less than 25% of the final grade resulting from medical or personal situations lasting up to three calendar days:
 - Students may submit a maximum of one academic work missed request per term. It is the

responsibility of the student to follow up with instructors immediately (within the 3 day period that is specified in the MSAF) regarding the nature of the accommodation. All work due in that time period however can be covered by one MSAF.

- MSAF cannot be used to meet religious obligation or celebration of an important religious holiday, for that has already been completed or attempted or to apply for relief for any final examination or its equivalent.

2) For medical or personal situations lasting more than three calendar days, and/or for missed academic work worth 25% or more of the final grade, and/or for any request for relief in a term where the MSAF has not been used previously in that term:

- Students must visit their Associate Dean's Office (Faculty Office) and provide supporting documentation.

E-Learning Policy

Consistent with the Bachelor of Technology's policy to utilize e-learning as a complement to traditional classroom instruction, students are expected to obtain appropriate passwords and accounts to access Avenue To Learn for this course. Materials will be posted by class for student download. It is expected that students will avail themselves of these materials prior to class. Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail account, and program affiliation may become apparent to all other students in the course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about this disclosure please discuss this with the course instructor. Avenue can be accessed via <http://avenue.mcmaster.ca>.

Communications

It is the student's responsibility to:

- Maintain current contact information with the University, including address, phone numbers, and emergency contact information.
- Use the University provided e-mail address or maintain a valid forwarding e-mail address.
- Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their @mcmaster.ca alias.
- Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias.
- Check the McMaster/Avenue email and course websites on a regular basis during the term.

Turnitin (Optional)

This course will be using a web-based service (Turnitin.com) to reveal plagiarism. Students submit their assignment/work electronically to Turnitin.com where it is checked against the internet, published works and Turnitin's database for similar or identical work. If Turnitin finds similar or identical work that has not been properly cited, a report is sent to the instructor showing the student's work and the original source. The instructor reviews what Turnitin has found and then determines if he/she thinks there is a problem with the work. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit work to Turnitin.com. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to <http://www.mcmaster.ca/academicintegrity/turnitin/students/>

Protection of Privacy Act (FIPPA)

The Freedom of Information and Protection of Privacy Act (FIPPA) applies to universities. Instructors should take care to protect student names, student numbers, grades and all other personal information at all times. For example, the submission and return of assignments and posting of grades must be done in a manner that ensures confidentiality.

<http://www.mcmaster.ca/univsec/fippa/fippa.cfm>

Academic Accommodation of Students with Disabilities Policy

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail sas@mcmaster.ca. For further information consult McMaster's policy for Academic Accommodation of Students with Disabilities

<http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf>

Students must forward a copy of the SAS accommodation to the instructor of each course and to the Program Administrator of the B.Tech. Program immediately upon receipt. If a student with a disability chooses NOT to take advantage of a SAS accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. <http://sas.mcmaster.ca>

Student Code of Conduct

The Student Code of Conduct (SCC) exists to promote the safety and security of all the students in the McMaster community and to encourage respect for others, their property and the laws of the land. McMaster University is a community which values mutual respect for the rights, responsibilities, dignity and well-being of others. The purpose of the Student Code of Conduct is to outline accepted standards of behavior that are harmonious with the goals and the well-being of the University community, and to define the procedures to be followed when students fail to meet the accepted standards of behavior. All students have the responsibility to familiarize themselves with the University regulations and the conduct expected of them while studying at McMaster University.

<http://judicialaffairs.mcmaster.ca/pdf/SCC.pdf> and <http://www.mcmaster.ca/policy/Students-AcademicStudies/StudentCode.pdf>