Programming Fundamentals

Elec&Comp EngTech - CompSc-Acad Del

Course Number:	Equivalencies:	Pre-Requisites:
COMP 10001	N/A	N/A
Applicable Program(s):	**Core/Elective:**	
447 - C.S. Tn -Ntwk Sys NonCo-op	Core	
455 - C.S. Tn - Ntwk Sys Co-op	Core	
548 - C.S.Techn.-Software Support	Core	
555 - CST-Ntwrk Eng&Sec Analyst(C)	Core	
558 - C.S.Techn.-Software Supp - CoOp	Core	
559 - CS Technology-Software Devlpt	Core	
Prepared by:	Stephen Adams, Professor	
Approved by:	Elizabeth Martin, Associate Dean	
Approval Date:	Tuesday, October 6, 2020	
Approved for Academic Year:	2020-2021	
Normative Hours:	70.00	
Course Level:	Foundational	

Course Description

Build a foundation for learning and practicing the discipline of Software Engineering and the application of tools and methods to produce and maintain quality software systems. Develop essential skills to create software structures and logic. Develop knowledge and disciplines which are transferrable to any computer-based software problem.

Relationship to Vocational Learning Outcomes

This course contributes to your program by helping you achieve the following Vocational Learning Outcomes:

447 - C.S. Tn -Ntwk Sys NonCo-op

VLO 1	Identify, analyze, develop, implement, verify and document the requirements for a computing environment. (T, A,)
VLO 6	Select and apply strategies for personal and professional development to enhance work performance. (T, A,)

455 - C.S. Tn - Ntwk Sys Co-op

VLO 1	Identify, analyze, develop, implement, verify and document the requirements for a computing environment. (T, A,)
VLO 6	Select and apply strategies for personal and professional development to enhance work performance. (T, A,)
VLO 11	Automate routine tasks using scripting tools and programming languages. (T, A,)

548 - C.S.Techn.-Software Support

VLO 1	Identify, analyze, develop, implement, verify and document the requirements for a computing environment. (T, A,)
VLO 4	Implement robust computing system solutions through validation testing that aligns with industry best practices. (T, A,)

555 - CST-Ntwrk Eng&Sec Analyst(C)

VLO 1	Identify, analyze, design, develop, implement, verify and document the requirements for a computing environment. (T, A,)
VLO 6	Select and apply strategies for personal and professional development to enhance work performance. (T, A,)

558 - C.S.Techn.-Software Supp -CoOp

VLO 1	Identify, analyze, develop, implement, verify and document the requirements for a computing environment. (T, A,)
VLO 4	Implement robust computing system solutions through validation testing that aligns with industry best practices. (T, A,)

559 - CS Technology-Software Devlpt

VLO 1	Identify, analyze, design, develop, implement, verify and document the requirements for a computing environment. (T, A,)
VLO 4	Analyze, develop and maintain robust computing system solutions through validation testing and industry best practices. (T, A,)

Relationship to Essential Employability Skills

This course contributes to your program by helping you achieve the following Essential Employability Skills:

EES 1	Communicate clearly, concisely and correctly in the written, spoken and visual form that fulfills the purpose and meets the needs of the audience. (T, A,)
EES 2	Respond to written, spoken or visual messages in a manner that ensures effective communication. (T, A,)
EES 3	Execute mathematical operations accurately. (T, A,)
EES 4	Apply a systematic approach to solve problems. (T, A,)
EES 5	Use a variety of thinking skills to anticipate and solve problems. (T, A,)
EES 10	Manage the use of time and other resources to complete projects. (T, A,)
EES 11	Take responsibility for one's own actions, decisions and consequences. (T, A,)

Course Learning Outcomes/Elements of Performance

When you have earned credit for this course, you will have demonstrated the ability to:

CLO 1. Create algorithms using structured techniques.

EOP 1.1. Use pseudocode as an intermediary language between English and the programming language to describe an algorithm.

EOP 1.2. Decompose problems using IPO charts to clearly define the input, processing and output requirements of a computer software solution.

EOP 1.3. Design algorithms to solve problems which require a combination of mathematical, logical and relational calculations using sequential, iterative and conditional execution.

EOP 1.4. Develop flowcharts to aid in the design of the logic of an algorithm.

EOP 1.5. Use hierarchy charts to recognize dependancies and plan for modular program development.

CLO 2. Convert pseudocode algorithms into software using a programming language.

EOP 2.1. Use an integrated development environment to edit, compile, and execute a computer program.

EOP 2.2. Understand the differences between standard data types and choose appropriate implementations.

EOP 2.3. Use input and output statements to acquire and display data.

EOP 2.4. Use Boolean expressions to make decisions within a program.

EOP 2.5. Use branching instructions to provide different paths of execution within a program

EOP 2.6. Use mathematical operators to construct expressions and evaluate calculations within a program

EOP 2.7. Use looping constructs to provide repetition of statements for problems requiring iteration.

EOP 2.8. Use function calls of the selected programming environment within an application.

EOP 2.9. Use comments to document and clarify the operation of a computer program.

CLO 3. Evaluate operation of developed computer programs for correctness.

EOP 3.1. Select appropriate data sets to validate operation of a solution.

EOP 3.2. Validate the output of a program against an existing correct solution manually using program tracing techniques.

EOP 3.3. Determine the state of the computer program at different points of execution.

EOP 3.4. Use output statements within a program to assist with the debugging of an application.

Evaluation/Earning Credit

The following list provides evidence of this course's learning achievements and the outcomes they validate:

Final Exam (25%)

Validates Outcomes: CLO 1, CLO 2, CLO 3, EES 1, EES 2, EES 3, EES 4, EES 5, EES 11

447 : VLO 1, VLO 6
455 : VLO 1, VLO 6
548 : VLO 1, VLO 4
555 : VLO 1, VLO 6
558 : VLO 1, VLO 4
559 : VLO 1, VLO 4

Midterm Exam(s) (45%)

Validates Outcomes: CLO 1, CLO 2, CLO 3, EES 1, EES 2, EES 3, EES 4, EES 5, EES 11

447 : VLO 1, VLO 6
455 : VLO 1, VLO 6
548 : VLO 1, VLO 4
555 : VLO 1, VLO 6
558 : VLO 1, VLO 4
559 : VLO 1, VLO 4

Assignment(s) (30%)

Validates Outcomes: CLO 1, CLO 2, CLO 3, EES 3, EES 4, EES 5, EES 10, EES 11

447 : VLO 1, VLO 6
455 : VLO 1, VLO 6, VLO 11
548 : VLO 1, VLO 4
555 : VLO 1, VLO 6
558 : VLO 1, VLO 4
559 : VLO 1, VLO 4

Learning Resources

Required Book:

Practical Programming (Third Edition): An Introduction to Computer Science Using Python 3.6
Paul Gries, Jennifer Campbell, Jason Montojo
ISBN-13: 978-1-6805026-8-8

eBook available

Delivery Format

5 Hour Lab per week

Prior Learning Assessment and Recognition

Students who wish to apply for prior learning assessment and recognition (PLAR) need to demonstrate competency at a post-secondary level in all of the course learning requirements outlined above. Evidence of learning achievement for PLAR candidates includes:

- Challenge Exam

Grade Scheme

Elec&Comp EngTech - CompSc-Acad Del Statements

Equipment Failure:
If equipment fails or crashes during a test or a lab independent of the student input, the student will have the opportunity for a re-write of the test or an equivalent version. The course Professor will set the date for the re-write.

Proctored Evaluations:
Students **MUST PASS** the proctored component (i.e. tests, midterms and exam) of the course in order to receive a passing grade. If the student does not pass the proctored component, they will receive the grade for the proctored component **ONLY** as their final grade.

Statement of Authorship - 2:
Written assignments and code work that do not contain a Statement of Authorship may result in a grade of 0.

Test and Exam Rooms:
Tests and exams must be written in the rooms specified. Writing a test or exam in a lab not approved by the professor will result in a zero on the test or exam and the initiation of an academic offence.

Course Related Information

See LMS Web page for the Course Details

Department Related Information

Please note:

- The final grades for this course will not be posted on myCANVAS. Final exams may be posted but only after all grades are posted in myMohawk.
- Under special circumstances, tests and exams may need to be written using remote proctoring applications. Students may be required to submit to some form of visual identification and be available for verification duration of the test or exam. Please refer to your myCANVAS course pages for directions from your professor.

College Related Information

Mohawk College is committed to creating a learning community where all students and staff experience a safe and respectful work and study environment. College policies and procedures respect individual rights and responsibilities, promote accountability, fairness and due process. Students are expected to familiarize themselves with Mohawk College's Policies and Procedures accessible through the College website http://www.mohawkcollege.ca/corporate-policies-procedures/student.html

Students with permanent or temporary disabilities who require academic accommodations are encouraged to register with Accessible Learning Services. Documentation outlining the functional limitations of disability is required; however, interim accommodations pending receipt of appropriate documentation is possible. All documentation is kept confidential in the office of Accessible Learning Services. For more information, contact (905) 575-2211 or email als@mohawkcollege.ca

Mohawk College is committed to the implementation of universal design for learning in order to support learners with disabilities, broadly promote inclusion and provide compliance elements for the Accessibility for Ontarians with Disabilities Act within the college community. Mohawk College courses will employ universal design for learning principles and/or initiatives and these elements will be indicated. For more information on the specific universal design for learning elements included in this course, contact the professor. For more information on universal design for learning, review the universal design for learning webpages http://www.mohawkcollege.ca/employees/centre-for-teaching-learning/universal-design-for-learning

In addition, students enrolled in Mohawk/McMaster collaborative programs are protected under McMaster University's policies and procedures outlined in General Academic Regulations, McMaster Undergraduate Calendar, and in McMaster's Academic Integrity Policy http://www.mcmaster.ca/academicintegrity/ .
Please be advised that all policies and procedures are subject to change.

To maintain academic integrity student submissions may be assessed using http://www.turnitin.com/

EFFECTIVE FALL 2009 - Policy: SS-3103-2009 in order to find this policy must go to: https://www.mohawkcollege.ca/registration-and-records/grading-evaluation/grading-system - Program Promotion and Graduation Requirements: A minimum grade of 50% is required as a course pass at Mohawk College. Please be aware, however, that a higher passing grade (minimum 60% or 70%) may be required if this course is taken as part of certain diploma or certificate programs. Please consult your Academic Department for details. Additionally, if you are taking this course as part of a diploma or certificate program, be aware that you need an overall weighted grade point average (WGPA) of at least 60% to graduate. Graduation requirements are higher for some programs. Please check requirements with your department.

PLEASE NOTE: Faculty are required to review Emergency Lockdown procedures and Emergency Evacuation Procedures, including Evacuation and Lockdown procedures for students with disabilities, at the first class of every course they are teaching each semester. This information is available in the College Emergency Safety and Security Procedures Booklet distributed to all staff in hard copy, or online in MyMohawk within the Human Resources Tab in the Occupational Health and Safety Channel (Occupational Health and Safety web site).

To understand your Course Outline please read the following document.
https://comms.blob.core.windows.net/public/mohawk/COMMS-Understanding_your_Course_Outline.pdf

Legend

Terms

•ALO = Aboriginal Learning Outcome
•Apprenticeship LO = Apprenticeship Learning Outcome
•CLO = Course Learning Outcome
•DPLO = Degree Program Learning Outcome
•EES = Essential Employability Skill
•EOP = Element of Performance
•GELO = General Education Learning Outcome
•LO = Learning Outcome
•ES = External Standard
•PLA = Prior Learning Assessment
•PLAR = Prior Learning Assessment and Recognition
•VLO = Vocational Learning Outcome

Assessment Levels

•T = Taught
•A = Assessed
•R = Reinforced