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| **Course Title: SEP101 Programming Fundamentals Year and Semester:** Year 1, Semester 1 |
| **Course Description**  Students explore the fundamental principles of computer programming with an emphasis on problem solving strategies using structured and object-oriented programming techniques. The C/C++ programming languages are used to introduce problem analysis, algorithm design, program implementation, and the fundamentals of object-oriented programming. Students become aware of the power of the C/C++ programming language through access to system level resources such as memory and hardware, since C and C++ combine the features of both high level and low-level  languages. |
| **Prerequisite(s) or co-requisite(s)**  None |
| **Method of Instruction**   * Lecture * Laboratory |
| **Content Outline by Topic**   * Introduction * Computations * Structured programming constructs * Testing and Debugging * Data Structures * Classes * Functions * Pointers * Secondary Storage * Refinements |
| **Actual Contact Hours/Week**  4 hours a week for 14 weeks |
| **Methods and Frequency of Evaluation of Student Performance**  Workshops (minimum 5) 20%  Assignments (minimum 2) 30%  Quizzes (minimum 10) 10%  Test(s) 20%  Final Exam 20% |
| **Resources to be Purchased/Provided by Students:** None |
| **Textbook Requirement:** Programming Fundamentals Using C by Chris Szalwinski  Available in the Seneca campus bookstore  C Programming Language (2nd Edition) by Brian W. Kernighan and Dennis Ritchie Prentice Hall  ISBN-10: 0131103628 |

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| ISBN-13: 978-0131103627  http://libaccess.senecacollege.ca/login?url=https://[www.safaribooksonline.com/library/](http://www.safaribooksonline.com/library/) view/the-c-programming/9780133086249/?ar&orpq&email=^u  C++ Primer (5th Edition)  by Stanley B. Lippman, Josee Lajoie, and Barbara Moo Addison-Wesley Professional  ISBN-10: 9780321714114  ISBN-13: 978-0321714114  http://libaccess.senecacollege.ca/login?url=https://[www.safaribooksonline.com/library/](http://www.safaribooksonline.com/library/) view/c-primer-fifth/9780133053043/?ar&orpq&email=^u |
| **Learning Outcomes**  *Upon successful completion of this course the student will be able to:*   1. Design functions using selection and iteration constructs to solve a programming task. 2. Connect functions using pass-by-value and pass-by-address semantics to assemble a complete program. 3. Design collections using arrays, structures and classes to manage data efficiently. 4. Code algorithms using standard library functions to incorporate existing technology into programming solutions. 5. Stream data using standard library functions to interact with users and access persistent data. 6. Trace the execution of a procedural program to validate its correctness. 7. Code programs using object and pointer types to implement solutions to practical problems. |
| **Faculty Qualifications to Teach this Course**  Masters or PhD in computer science, software/electrical engineering |
| **Faculty Qualified to Teach/Supervise this Course**  Tamanna Chhabra, PhD |
| **Percentage of Course Content Offered Online**  0% Interactive content online |
| **Classroom Requirements**  ☒Regular classroom   * Electronic classroom   ☒Computer Lab   * Activity-based Learning centre |
| **Equipment Requirements**  College computers are configured to support this course. If you use your own computer, you will need:   * Current version of an operating system (Mac OS X, Windows, Linux), with Internet access * Software development tools, including text and/or programmer's editor(s), and compiler(s) |