## Course plan

(75 hours) 2-3-3

420-D02-SU

# Introduction to structured programming

AEC Programming, Networks and Security (LEA.5F)

AEC Programming and Web Technologies (LEA.5G)

AEC Video Game Programming (LEA.CU)

# *Competencies*

* 016S – Use a structured programming language  
  Required course: D02 (INT, NET, WEB)
* 016W – Produce algorithms  
  Required course: D02 (INT, NET, WEB)

# *General objectives*

* Become acquainted with a methodology for problem solving and building algorithms
* Learn the concepts and techniques of structured programming with the help of the language C++

### *Specific objectives*

* Recognize and manipulate different types of digital code
* Learn a method for problem solving
* Produce system documentation
* Define the steps of solving problems in informatics
* Make pseudo-code responding to the constraints of a problem to solve
* Use single and double conditional structures
* Use repetition structures
* Learn methods of algorithm verification
* Know the syntax and the structure of the language C++
* Develop programs in a structured and modular fashion
* Evaluate the structures of a program
* Apply programming standards
* Follow program specifications
* Simplify complex logical relations
* Manipulate character strings
* Apply an understanding of arrays
* Apply different sorting algorithms and techniques
* Apply methods for searching arrays
* Update a program
* Build programs following programming standards
* Use an integrated development environment to facilitate the development, testing, and debugging of complex programs

***Content outline***

# Module 1 – Basic concepts and algorithms

Numbering systems (binary, octal, decimal, hexadecimal)  
Introduction to methods of solving problems in informatics

# Module 2 – Fundamental concepts in the C++ language

**Introduction**

Microsoft Visual C++  
Structure of a C++ program  
Keywords  
Identifiers  
Data types  
Constants  
Declarations

**Operators and expressions**

Arithmetic operators  
Relational and logical operators  
The assignment operator

**Control structures**

If/else statements  
While loops  
Do/while loops  
For loops  
Switch/case statements  
Break statements

# Module 3 – Functions

Definition of a function  
Purpose of a function  
General syntax  
Examples  
Parameters  
Parameters passed by value

# Module 4 – Arrays and character strings

**Arrays**

Definition of a one-dimensional array  
Initializing arrays  
Manipulating arrays  
Bubble sort algorithm  
Searching arrays  
Two-dimensional arrays

**Character strings**

Definition of a character string  
Initializing character strings  
Manipulating character strings

***Methodology***

Lectures  
Laboratories in class  
Practical project

***Formative evaluation***

Laboratories in class

***Summative evaluation***

Exercises 10%  
Practical project 25%  
Evaluation 1 15%  
Evaluation 2 15%  
Final evaluation 35%

Note:

It is obligatory to obtain at least 50% in the exams in order for the practical project to be graded. The practical project must be done in teams of 2 or 3 people. In order for the grade of the final exam to be considered, the practical project must be submitted before the final exam.

**Standards of l’Institut supérieur d’informatique**

With the aim of ensuring a high quality of education and maintaining the smooth operation of our facilities, the following rules are applied:

Absences and lateness:

If you miss more than 20% of class time for a course, you will expose yourself to a failing grade for the course, without the right to take a supplemental examination.

If you are absent on the day of an examination, you will receive 0% for this examination. Only the directors can authorize you to retake the examination on another day. A doctor’s note is not necessarily a sufficient justification. Each case will be assessed on its own merits and a minimum fee of $25 will be applied.

If you are late to class, you may be refused access to the class until the break.

Examinations:

For courses involving practical projects and examinations, you must achieve at least 50% on the examinations in order for the practical projects to be graded.

The corrected examinations will be temporarily handed back to the students for consultation, and subsequently collected again by the instructor for archiving.

During examinations:

* It is forbidden to leave the classroom under any circumstances. If a student leaves the classroom, they must hand in their examination to the instructor, who will consider their examination to be finished.
* No documents, bags, or briefcases can be on the desks. Each student must be sure to clear their desk before the beginning of the examination. The instructor will ensure the application of this standard.
* The use of electronic devices, cell phones, or other devices is forbidden. Any violation of this standard will result in the immediate termination of the examination for the student.

Practical projects:

The practical projects must necessarily be done in teams of 2 or 3 people. A minimum of 5 hours could be added to the course hours for the practical projects; attendance during these periods is mandatory. In order for the final examination grade to be considered, the practical projects must be submitted before the final examination. The practical projects will be presented to the group by the instructor during the period following the examination.

Grade review:

As specified in our PIEA (Politique institutionnelle d’évaluation des apprentissages), approved by the MEES (Ministère de l’Éducation et de l'Enseignement supérieur), if you wish to have a grade reviewed, you must submit a grade review request to the directors within ten (10) working days after the grades are submitted to the students or posted on the school’s intranet.

Supplemental examinations:

You will be entitled to a supplemental examination for a course only if:

1. you achieved a grade of at least 45% on all of the evaluations for the course,
2. you were absent for less than 20% of the class time for the course,
3. you submitted all examinations and practical projects for the course,
4. you pay a minimum fee of $25.

If these four conditions are not met, you will need to retake the course.

A supplemental examination replaces the regular examinations for the course. A grade of at least 50% must be obtained on the supplemental examination in order for the practical project to be considered.

Following a supplemental examination, the maximum final grade for the course will be 60%.

Prerequisites:

In order to have access to the final projects and internships, you must have successfully completed all of the courses in the program. Tuition fees must be fully paid before the internships.

Withdrawal:

In order to withdraw from courses, a written withdrawal request must be submitted to the admissions office. The withdrawal will take effect on the date that the request is received. If the request is received within the first ten (10) working days of a semester, the courses for this semester will be cancelled in your transcript (but not the tuition fees); furthermore, you will receive no financial assistance and no failing grades for the semester. However, after this period, you will receive financial assistance for the semester, if applicable, and your transcript will display the grades accumulated up until the date of withdrawal.

Food:

It is strictly forbidden to drink, eat, or smoke outside of areas specifically reserved for these activities.

Cell phones and laptops:

It is required to turn off your cell phone when you enter the college. It is forbidden to bring your own personal laptop to the college.