2021-2022	Common Trunk	Year 1 - Sem. 1
INFO101	**Programming I**	**Mandatory**
ECTS: **3**	*Instructors: M. ELROZ, G. NASR, B. ETER, I. JOUMAA, M. AWDE*	*Language:* English/French
Total hours: **39 h**	Period : October - February	

Description:

Introduction to general concepts and algorithms. We present the information coding and arithmetic operations in binary (positive and signed integers, real numbers) and any base. We then present general concepts in computer science (compiler, IDE, interpreted language ...) then the main course part which is algorithmic. It discusses the main types of variables, arithmetic and logical instructions input / output, instructions of choice (single and multiple) and finally the control loops (for, while, do / while). Examples of basic algorithms illustrate concepts discussed throughout the course and exercises sessions.

Learning outcomes:

- Understand how information is encoded in a computer memory.
- Consider different types of information encoding and understand why and how they are different.
- Learn how to express numbers in different bases and how to convert from one into another.
- Perform basic arithmetic operations on different types.
- Perform basic arithmetic operations in different basis.
- Overview different kinds of languages, and learn what is a compiled language and an interpreted one.
- Understand the difference between a general resolution method, an algorithm and a program.
- Identify different parts of an algorithm.
- Learn how to evaluate different characteristics of an algorithm: complexity, memory consumption, etc.
- Build simple, intermediate and complex algorithms, with application to essential and basic most-used algorithms.

Content:

- Representation of positive integers in base 2 - Limits. Base Conversions 2, 8,10, 16. Two's complement (negative integers) Limits. Shift left, shift right. Operations on integers in base 2: +, -, *, /.
- Real numbers representation: Simple and double precision floating point.
- Definition of an algorithm/program.
- Environment of an algorithm.
- Structure and components of an algorithm / Variables / Types / Declaration / Allocation of variables / stack / heap.
- Algorithmic languages. Compilation vs. Interpretation. Example of integration platform: .Net.
- Definition and characteristics of an algorithm.
- Environment of an algorithm.
- Basic Instructions: -The various arithmetic and logical operators/Operators Precedence - Instructions of read / write on the screen - simple choice instruction if / else - The multiple choice instruction switch/case- Some basic algorithms: minimum and maximum of two or three numbers, design of a menu. – Control loops – One-dimensional and multidimensional arrays.
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References:

- Bassam ETER , Langage C#.Net.

Evaluation Method:

Assessment in the following areas will be converted to points, to compute your final grade in this course:

- Mid-Term
- Final Exam
- Home Works

Description :

Introduction aux notions générales de l'informatique et introduction à l'algorithmique. On présente le codage de l'information et les opérations arithmétiques en base binaire (entiers positifs et signés, nombre réels) et dans une base quelconque. On présente ensuite des notions générales en informatique (compilateur, IDE, langage interprété…) puis la partie principale de cours qui est l'algorithmique. On y aborde les principaux types de variables, les opérateurs arithmétiques et logiques, les instructions d'entrée/sortie, les instructions de choix (simple et multiple) et enfin les boucles de contrôle (for, while, do/while). Des exemples d'algorithmes de base illustrent les notions abordées tout au long du cours et des td.