# LINGI1122

*2012-2013*

# Program conception methods

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| 5.0 credits | 30.0 h + 30.0 h | 2q |

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| Teacher(s) : | Le Charlier Baudouin ; |
| Language : | Français |
| Place of the course | Louvain-la-Neuve |
| Prerequisites : | -- algorithms and data structures (as taught in the course SINF1121)<br>-- experience in small-software programming small (as provided by the course SINF1121)<br>-- logical reasoning and reasoning by induction (as praticed in the course INGI1101) |
| Main themes : | -- Methods to design and prove programs<br>-- Program transformations and techniques used to improve the efficiency<br>-- Program schemes and problem classes |
| Aims : | Students completing successfully this course will be able to<br>-- imagine a correct and efficient algorithm to solve a given problem<br>-- create and specify the design for a software product using an accepted program design methodology and appropriate design notation<br>-- demonstrate the exactness of complex algorithms<br>Students will have developed skills and operational methodology. In particular, they have developed their ability to<br>-- use a rigorous approach to ensure the correctness of the result, using mathematical tools<br>*The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled “Programmes/courses offering this Teaching Unit”.* |
| Evaluation methods : | -- written exam<br>-- project or test during the semester |
| Teaching methods : | -- Lectures every week<br>-- Practical exercises in which students apply in simple situations the concepts described in the lectures<br>-- Project to practice techniques in the case of a larger application |
| Content : | -- Methods to design and prove programs : invariant methods, wp calculus, induction on structures.<br>-- Program transformations and techniques used to improve the efficiency<br>-- Program schemes and problem classes: global research schemes (backward path, selection and evaluation, binary research), local research schemes (voracious strategy; gradient research, simulated annealing), structural reduction schemes (split to reign, dynamic programming, relaxation, constraints). |
| Bibliography : | -- textbook online<br>-- statement of exercises online |
| Cycle and year of study : | > Bachelor in Engineering<br>> Bachelor in Computer Science<br>> Preparatory year for Master in Computer science<br>> Bachelor in Engineering : Architecture<br>> Bachelor in Economics and Management<br>> Bachelor in Mathematics |
| Faculty or entity in charge: | INFO |