



## **COURSE OUTLINE**

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### **Course identification**

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Name of programs – Codes:	COMPUTER SCIENCE TECHNOLOGY- PROGRAMMING - 420.BP INFORMATION TECHNOLOGY PROGRAMMER- ANALYST - LEA.3Q
Course title:	<b>INFORMATION SYSTEM ANALYSIS AND MODELING</b>
Course number:	420-AS2-AS
Total number of course hours:	90
Weighting:	3-3-3
Statement of the competency – Code:	Collaborate on the design of applications -00SY

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### **Contribution of the course in the program**

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#### **Course position**

This course is located in the second semester of the *Information Technology Programmer-Analyst* (LEA.3Q) and in the third semester of the *Computer Science technology – Programming* (420.BP) program. Its duration is 90 hours divided into 45 hours of theory and 45 hours of exercises plus approximately 45 hours of homework.

In *Information Technology Programmer-Analyst* (LEA.3Q) program, this course is the only one to develop the 00SY competency. In the *Computer Science technology – Programming* (420.BP) program, this course shares the development of the 00SY competency with *IOS Mobile Development II* (420-DM6-AS) and *Information Systems Implementation* (420-MP6-AS) given in the sixth semester, finalizing the development.

In both programs, there are no prerequisites. In *Information Technology Programmer-Analyst* (LEA.3Q) program, this course is a prerequisite for *Trends in technology* (420-TT4-AS) and *Internship* (420-SG4-AS) both given in fourth semester. In *Computer Science technology – Programming* (420.BP) program, this course is a prerequisite for *Information Systems Implementation* (420-MP6-AS) and *Trends in technology* (420-TT4-AS) given in the sixth semester.

#### **Scope of the course**

During this course, the students construct knowledge of concepts and use tools pertaining to the planning and development phases of Information systems. Practical as well as theoretical approaches will be

implemented in class with focus on the skills that a programmer analyst needs in order to better understand and define problems, opportunities or needs for Computer information systems within corporations. Students will work with the planning, analysis and design phases. They will produce relevant diagrams and reports related to various milestones using the database as well as the Object Oriented approaches for processes and data modeling. Students will work with UML diagrams such as use case, class and sequence diagrams. They will apply both the Waterfall and the Agile/SCRUM approaches to develop automated solutions.

Upon completion of this course, the student will be acquainted with the various analytical tools and methodologies, He will work with the initial SDLC phases of planning, analyzing, researching and modeling a solution and using the right technical software tools to document their findings. Various case studies, as well as a final project, will help master the implementation and demonstration of those skills throughout the session. Students will know which methodology or approach is best used in the System Development Life Cycle (SDLC) according to client specifications. They will experience building a project using both the Waterfall and SCRUM approaches. As well as using diagramming and feature management tools.

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## Course components (objective and standard of the competency)

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### Expected outcomes (achievement context of the competency)

*The achievement context of this competency will reflect the conditions as they occur in the following settings: academic, professional, work, or life environment.*

- Based on the client's requests and requirements
- Using application development standards, methods and best practices

*Throughout the course, you will engage in various learning situations/activities so that by the end of the course, you will have met the expected outcomes.*

### Elements and performance criteria

*The elements of an objective formulated in terms of the competency specify its essential components. They include only what is necessary in order to understand and master the competency. If the competency is described as a process, the elements are the steps for execution.*

*The performance criteria are the specific pre-established requirements upon which you and your teacher can objectively judge your development of the targeted competency. They are part of the description of this competency. They are prescriptive.*

*Sometimes an element appears in more than one course. If this is the case, a number indicates its complexity level: level one (1) being the simplest, level two (2), average, and level three (3), advanced, at the ministerial level.*

*Below are the elements of the competency and performance criteria for this course that are to be respected:*

<p><b>Competency:</b> Collaborate on the design of applications – 00SY</p>
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<p><b>General ministerial and institutional performance criteria:</b></p>
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| <ul style="list-style-type: none"> <li>– Demonstration of intellectual curiosity.</li> <li>– Demonstration of critical thinking.</li> </ul> |
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<ul style="list-style-type: none"> <li>– Demonstration of analytical thinking.</li> <li>– Sense of organization</li> </ul>	
<b><i>Elements of the competency</i></b>	<b><i>Performance criteria specific to each element</i></b>
1. Participate in the development of the functional specifications	1.1 Accurate analysis of the client's request and requirements 1.2 Accurate analysis of the features of the computer equipment and applications used by the client 1.3 Appropriateness of the recommendations regarding the nature of the requirements 1.4 Appropriateness of the recommendations regarding application development standards, methods and best practices
2. Participate in the overall design of the applications.	2.1 Appropriateness of the recommendations regarding the choice of software architecture 2.2 Sound assessment of the software and hardware components to be used 2.3 Appropriateness of the recommendations regarding security measures to be implemented 2.4 Appropriateness of the recommendations regarding test strategies to be used 2.5 Appropriateness of the recommendations regarding the feasibility of the computing solution
3. Develop the detailed design.	3.1 Modelling of a database aligned with user needs 3.2 Clear identification of the initial data in the database 3.3 Clear description of the application logic and interface to generate or program 3.4 Object-oriented modelling compliant with principles of encapsulation, inheritance, composition and polymorphism 3.5 Proper choice or production of algorithms 3.6 Compliance with nomenclature rules
4. Produce design documents.	4.1 Accurate graphical representation of the different models 4.2 Accurate drafting of unit, integration, functional or acceptance test plans 4.3 Active participation in the design review 4.4 Use of appropriate vocabulary 4.5 Compliance with application development standards, methods and best practices

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## Course content/main themes

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Listed below is the **essential** content to be covered in this course:

1. Information systems and End-users hierarchy and needs
    - ☐ SDLC and system development methodologies
  2. Projects definition and Scope
    - ☐ Planning and the Cost/benefit analysis (time, cost and resources)
    - ☐ Scheduling feasibility
  3. Analysis and requirements determination (Functional and Non-Functional Requirements)
  4. UML diagrams and data modeling (Use case, class, sequence diagrams and ERDs). Using collaborative tools to draw diagrams such as draw.io, Visio or any existing online collaborative tool.
    - ☐ Detailed and uml use case diagrams
    - ☐ Class diagrams
    - ☐ Sequence Diagrams
    - ☐ Relational databases ERD and O-O ERD
    - ☐ Designing user interfaces
  5. Learning Agile (SCRUM, XP, Lean and Kanban)
  6. SCRUM principles and Planning (Product Backlog, user stories, tasks, acceptance criteria, prioritization, estimation, and definition of done) using applications for managing features and tasks such as Trello boards, Git (for features), Click UP or JIRA.
  7. Presentations and final reports
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## Learning activities

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Provided below are examples of learning activities that correspond to the competency for this course. The learning activities are found in the course calendar that complements this course outline.

- Document writing and oral presentation
  - Exchanging with peers
  - Case studies
  - Team work
  - Problem solving
  - Project development in teams
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## Terms for Evaluating Learning

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The evaluation of your learning is based on two inseparable methods: formative evaluation and summative evaluation. These two evaluation types are formal. Detailed information on the evaluation

schedule is found in the course calendar, under the “Formative and summative evaluation schedule” column.

## Formative evaluation

Following a learning activity or learning period, time is set aside for introspection. You will determine what has been understood and achieved and seek to identify the nature and origin of weak areas. These designated periods consist of simple means: short tests, association games, logbooks, a portfolio, questions, creating of samples, etc.

Formative evaluation is frequent and covers as many aspects as possible. It takes place in class, individually or in groups, and leads to immediate decisions. **You are the one who assumes the bulk of the work during individual or group corrections, adjustments and other self-evaluation tasks. The purpose is not to determine grades.**

If you take the results of the formative evaluations seriously throughout the course, you will ensure preparedness for the summative evaluations. You will be able to make the necessary progress to acquire the targeted competency at the required level, according to the achievement context and pre-established performance criteria.

Below are some examples of formative evaluation methods that correspond to the targeted competency for this course:

- Labs practice corrected in class
- Group work on problem solving
- Case studies treated in class and as homework
- Teacher feedback after students practice exercises
- Case Studies

## Summative evaluation

Summative evaluations are less frequent. They take place later on, towards the middle and end of the semester. This gives you the time to integrate your learning and to learn how to apply it to situations related to the targeted competency. The summative evaluation material is prepared by your teacher according to the description of the course’s targeted competency: its elements, achievement context and performance criteria.

**The work completed in summative evaluations is graded. The purpose is to determine what you have learned.**

Below is the information on the summative evaluation schedule and details for this course, as well as the weighting of marks:

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<b>Evaluations</b>	<b>Weighting</b>
Test 1	30 %
Final Project	30%
Final Exam	40 %
Total	100%

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## Institutional requirements

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### Student's commitment

*By registering for this course, you commit to:*

- *obtain the necessary course materials at the start of the semester;*
- *respect the copyright;*
- *participate in the learning activities, formative and summative evaluation activities outlined in the course calendar;*
- *complete the work assigned to you;*
- *submit the work on time.*

### Teacher's commitment

*Your teacher commits to:*

- *create varied learning situations that enable you to put into practice the knowledge, actions and professional behaviour of the targeted competency;*
- *plan sufficient and appropriate formative evaluation activities, involving correction and improvement, that provide frequent feedback, allowing you to be well informed of your progress;*
- *provide summative evaluations that correspond to the course's targeted competency;*
- *evaluate work according to the applicable criteria, in a fair and equitable manner within a reasonable time.*

***The Institutional Policy on Evaluating Learning (IPEL) is applied to all institutional programs. Listed below are a few of its clauses:***

#### ***Written language (article 5.7)***

*The teacher is responsible for identifying spelling and grammar errors and for allocating the corresponding number of marks for any given summative evaluation.*

*Below is the % – based on language requirements – that can be attributed to each summative evaluation:*

- *up to 5% for LEA.3Q and 10% for 420.BP*

#### ***Class attendance (article 5.12)***

*Attendance and participation in classes and evaluations are mandatory for all students.*

*The teacher has the responsibility of monitoring attendance and of evaluating the reasons justifying student absences from classes.*

*A student whose absences exceed the allowable number for the course could be denied access to the final exam for that course.*

### **Plagiarism and fraud (article 5.16)**

*Plagiarism, attempted plagiarism or complicity in plagiarism during an assignment or any evaluated task contravenes the rules. This includes (but is not limited to):*

- *the whole or partial presentation (reference, paraphrase, summary, translation, insertion) of the work of another (text, illustration, film, music, etc. on paper or online) as one's own, or failing to cite a source;*
- *the use of another student's exam during an exam;*
- *the use of an assignment done for another course or a project already submitted in the past, which is passed off as an original work.*

*Fraud, attempted fraud or complicity in fraud constitutes an infraction.*

*This includes (but is not limited to):*

- *the possession or use of any unauthorized document, material or equipment during an exam, including the use of technological tools;*
- *the execution of an evaluated task by another person;*
- *the substitution for another person during an exam, assignment or any evaluated task;*
- *the possession of the questions or answers of the exam;*
- *the obtainment of any aid not authorized in advance by the teacher.*

*Plagiarism, attempts at plagiarism or fraud, or collaboration in plagiarism or fraud are prohibited and considered serious offences. Thus, any instances of plagiarism or fraud will lead to a grade of '0' for the assignment in question. In addition, a note will be made in the student's file and the student will receive a written notice from his or her Program Directorate to that effect.*

*In the case of recidivism, in the same course or in another course, the student will be given a grade of '0' for the course in question. A second note is made in the student's file and the student will receive a summons from his or her Program Directorate. For a third offence, he or she may be expelled from the College.*

### **Submission of work and tests (article 5.8)**

*All assignments must be submitted in class at the time designated by the teacher. Any late submissions result in a grade of zero (0).*

*Upon presentation of an official supporting document or valid reason for the absence, the student may request an extension from the teacher, who may accept or refuse the student's work and apply a penalty for the lateness.*

*Program Directorates do not accept student work. Assignments must be submitted directly to the teacher.*

## **Rules and regulations to follow**

### **Late arrivals**

*The teacher may refuse to admit to the classroom any student arriving late. A late arrival is considered an absence for that period.*

*Note: Students arriving late must recognize that the information they missed will not be repeated. Late students are therefore responsible for asking their peers about the material they missed. Arriving after the break, as well as leaving before the end of the class, may result in one or more hours of absence.*

### **Eating and drinking in class**

*Eating and drinking are prohibited in the classrooms, locker rooms and Documentation Centre. Food may only be eaten in the cafeteria, vending machine areas and student lounges.*

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## Mandatory course material

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- There is a manual for the course that the teacher will upload. Extra documentation will always be provided in class, as well as posted on Omnivox.
- Laptop with specifications mentioned on the college's website.  
LaSalle College. Bring Your Own Device. 2017. < <http://www.lasallecollege.com/future-students/bring-your-own-device> >

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## Bibliography for this course

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All course material will be provided for by the teacher. A manual that contains already all the course chapters and labs will be shared on Omnivox.

STELLMAN, Andrew and Jennifer Greene. *Learning Agile*. United States: O'Reilly Media, Inc., 2015.

Dennis, A., Wixom, B., and Tegarden, D. *Systems Analysis and Design: An Object-Oriented Approach with UML, 5<sup>th</sup> Edition*. 2015

FOWLER, Martin. *Introduction to martinowler.com*. 2015. <http://www.martinfowler.com/intro.html>.

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**Academic Studies Directorate approval:**     *Signature and date of approval*

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