INFORMATION SYSTEMS BSC

FIRST YEAR

First Semester

Course: Object Oriented Programming
Class hours: 80
Syllabus: Basic concepts of object orientation. Basic programming structures. Practice of developing algorithms and programming using an object-oriented programming language. encapsulation. Composition. Modularization. Inheritance. Basic concepts of graphical interface. Introduction to relational databases.

Course: Relational Database
Class hours: 80
Syllabus: Introduction to database management systems. Database design: conceptual, logical and physical. Conceptual model of entities and relationships. Relational data model. Functional dependencies and normalization. Definition (DDL) and data manipulation (DML) languages. Relational algebra. Transaction Management.

Course: Programming Logics
Class hours: 120
Syllabus: Programming logic and abstraction. Introduction to the concept and use of algorithms. An overview of programming paradigms. Data input and output. Variables. arithmetic operators. Arithmetic expressions. Relational operators. Logical operators. Control structures: sequential, conditional, repetition. Vectors and matrices. Lists, dictionaries and tuples. Modularization and use of functions. Techniques and practice of building algorithms. Recursion. Creating and reading files. Graphical interface implementation. Unitary tests. Code debugging.

Course: Object Oriented Modeling
Class hours: 80
Syllabus: Models and representations. Object-oriented concepts. Requirements fundamentals. Types of requirements: functional and non-functional. Analysis and design of object-oriented software. UML (Unified Modeling Language) models: Use-case model, class diagram, sequence diagram, activity diagram, state diagram, package diagram, component diagram, and deployment diagram.

Course: Integrated Software Project – Programming
Class hours: 40
Syllabus: Problem overview. Requirements gathering. Requirements specification. Object-oriented modeling. Implementation of algorithms to solve the problem. Graphical interface creation. Unit test.

Course: Special Projects and Activities I
Class hours: 80
Syllabus: Development of competencies, skills and attitudes relevant to the formation of future Engineer, through electives and student-centered practical activities. Training of interpretation and analysis skills. Problem solving methodologies. Development of projects. Technical visits, lectures, workshops, seminars and technological competitions. Participation In undergraduate monitoring programs, scientific projects and technological research, as well as participation in social responsibility projects.

Second Semester

Course: User Interface and Experience
Class hours: 80

Syllabus: Interfaces and interaction. Usability. User experience (UX). User-centric design. Human Factors. Generations of interfaces and interaction devices. Technological aspects. Design methods and techniques. Human-Centered Design Process. Persona Prototype. Methods for usability assessment. Standards for interfaces. Accessibility. Practical development in evaluation and construction of interfaces.

Course: Front end Development
Class hours: 80
Syllabus: Development of HTML pages. Fundamental HTML elements. Semantic HTML elements. CSS selectors and rules. Inline CSS. Colors, backgrounds, borders, padding and margins. Box model. Text, fonts, icons, links, lists, tables. Display property. Specificity of CSS selectors. Media queries. Introduction to the Javascript language. Variables. Lexical scope. Assignment, arithmetic, relational and logical operators. Selection and repetition structures. Collections. Functions. Closures. JSON objects. HTTP requests. Ajax. Typescript language. JSX. Bootstrap. Responsiveness. frameworksFrameworks. Micro Frontends.

Course: Laws Applied to Informatics and Computing
Class hours: 40
Syllabus: Laws applied to informatics and computing. Legal Aspects of the Internet and Electronic Commerce. Civil and criminal liability for the protection of information. Regulation of the work of the IT professional. Legislation relating to consumer protection rights. Considerations on service provision contracts. Rationale for Copyright Law. Software Law. Criminal sanctions related to electronic crimes. Data Protection Act.

Course: Statistics
Class hours: 80
Syllabus: Exploratory data analysis. Introduction to probability. Applications of probability distributions. Building confidence intervals. Hypothesis tests. Correlation and regression. Analysis of variance. Sampling.

Course: Mathematical Logic and Discrete Mathematics
Class hours: 80
Syllabus: Sets, set algebra and cardinality. Relations. propositional logic. Logical operators. Truth table. Equivalence and implication relations. Valid arguments. Deductive techniques. Direct proof. Conditional proof. Indirect proof or reduction to absurdity. Counting techniques. Binary relations. Induction and recursion. Propositional logic. Predicate Logic. Deductive Systems. Demonstration techniques.

Course: Integrated Software Project - Interface Design/ Front End
Class hours: 40
Syllabus: Graphical computer interface based on user experience (UX). Definition of an architecture for the Web system. Web implementation with focus on the front end.

Course: Special Projects and Activities II
Class hours: 40
Syllabus: Development of competencies, skills and attitudes relevant to the formation of future Engineer, through electives and student-centered practical activities. Training of interpretation and analysis skills. Problem solving methodologies. Development of projects. Technical visits, lectures, workshops, seminars and technological competitions. Participation In undergraduate monitoring programs, scientific projects and technological research, as well as participation in social responsibility projects.

SECOND YEAR

First Semester

Course: General Systems Theory
Class hours: 80

Syllabus: 1. Conceptualization and definition (s) SYSTEM. 2. Vision and systemic approach - the paradigms and changes. 3. Characterizations structures and systems. 4. Models and modeling system (relationships causalities). 5. Methodology and model development tools. 6. Behavioral systems. 7. Relationships man-environment in the systemic context - \ \ \ "scale inference \ \ \". 8. Dynamic systems - circular causalities 9. Systemic view of the organization and the organizational structures, interactions and communications between elements of a system. 10. Systemic Conceptualization and Soft Systems Methodology. 11. The pursuit of systemic result

Course: Calculation and Operational Research
Class hours: 80
Syllabus: Applications derived from the study of functions: maximum, minimum and concavity. Marginal functions. Elasticity. Concept of Integral, integration techniques and applications. Matrices, determinants and linear systems. Decision theory. General concepts. Decision matrix. Decision making under certainty (DTSC, via linear programming: the graphical method and simplex. Decision making under risk (DTSR, through Bayes Theorem and Sensitivity Analysis. Decision making under uncertainty (DTSI).