



Book of short descriptions by course

School of Computer Science

- 2019-I -

Lima: April 16, 2019

Task Force

Ernesto Cuadros-Vargas (Editor) <ecuadros@spc.org.pe>

Head of the School of Computer Science, Universidad de Ingeniería y
Tecnología (UTECH), Lima

President of the Peruvian Computer Society (SPC) 2001-2007, 2009

Member of the Steering Committee de ACM/IEEE-CS Computing Curricula
for Computer Science (CS2013)

Member of Steering Committee de ACM/IEEE-CS Computing Curricula 2020
(CS2020)

<http://socios.spc.org.pe/ecuadros>

Contents

First Semester	3
1.1 CS1100. Introduction to Computer Science	3
1.2 CS1D01. Discrete Structures I	3
1.3 QI0027. General Chemistry	3
1.4 GH0005. Communication Laboratory I	3
1.5 EG0003. Mathematics I	3
1.6 EG0004. Global Challenges	4
Second Semester	4
2.1 CS1102. Objects oriented programming I	4
2.2 CS1D02. Discrete Structures II	4
2.3 ME0019. Physics I	4
2.4 GH0006. Communication Laboratory II	4
2.5 GH0007. Introduction to Business Development	5
2.6 GH1002. Art and Technology	5
2.7 EG0005. Math II	5
Third Semester	5
3.1 CS1103. Objects oriented programming II	5
3.2 CS2201. Computer Architecture	6
3.3 CS2B01. Platform Based Development	6
3.4 EN0021. Physics II	6
3.5 GH0008. Business Management	6
3.6 EG0006. Math III	6
3.7 EG0007. Interdisciplinary Project I	7
Fourth Semester	7
4.1 CS2100. Algorithms and Data Structures	7
4.2 CS2101. Theory of Computation	7
4.3 CS2701. Databases I	7
4.4 IN0054. Statistics and Probabilities	8
4.5 GH0009. Peru, industrial country?	8
4.6 GH0011. Innovación y Desarrollo de Productos	8
4.7 EG0008. Interdisciplinary Project II	8

Fifth Semester	9
5.1 CS2102. Analysis and Design of Algorithms	9
5.2 CS2702. Databases II	9
5.3 CS2901. Software Engineering I	9
5.4 CS2S01. Operating systems	9
5.5 CS3402. Compilers	10
5.6 GH0010. Ethics and Technology	10
5.7 EG0009. Interdisciplinary Project III	10
Sixth Semester	10
6.1 CS2301. Networking and Communication	10
6.2 CS3101. Competitive Programming	11
6.3 CS3102. Advanced Data Structures	11
6.4 CS3903. Information systems	11
6.5 FG601. English for STEM	11
6.6 GH0012. Developing Economies	11
6.7 GH0015. Image and personal brand	11
Seventh Semester	12
7.1 CS2H01. Computer Human Interaction	12
7.2 CS3P01. Parallel and Distributed Computing	12
7.3 CS2501. Computer graphics	13
7.4 CS2601. Artificial intelligence	13
7.5 CS2902. Software Engineering II	13
7.6 AM0037. Science of Materials	13
7.7 GH0013. Critique of Modernity	13
7.8 GH0014. Cultures of governance and distribution of power	14
Eighth Semester	14
8.1 CS3909. Pre Professional Project	14
8.2 CS4002. Capstone Project I	14
Ninth Semester	14
9.1 CS3700. Big Data	14
9.2 CS3I01. Computer Security	14
9.3 CS4003. Final Project II	14
9.4 CS3501. Topics in Computer Graphics	15
9.5 CS3602. Robotics	15
9.6 CS3901. Software Engineering III	15
9.7 BI0021. Bioinformatics and Biostatistics	15
9.8 FG602. Business Communication	15
9.9 GH0016. Leadership and Negotiation	15
Tenth Semester	16
10.1 CS3P02. Cloud Computing	16
10.2 CS3P03. Internet of Things	16
10.3 CS4004. Final Project III	16
10.4 GH0017. Introduction to Quechua	16
10.5 GH0019. Entrepreneurs in Action	16
10.6 GH0020. Behavioral Economics	17

10.7 GH0021. Fiction Design 17

1.1 CS1100. Introduction to Computer Science

This is the first course in the sequence of introductory courses to Computer Science. This course is intended to cover the concepts outlined by the Computing Curricula IEEE-CS/ACM 2013. Programming is one of the pillars of Computer Science; any professional of the area, will need to program to materialize their models and proposals. This course introduces participants to the fundamental concepts of this art. Topics include data types, control structures, functions, lists, recursion, and the mechanics of execution, testing, and debugging.

1.2 CS1D01. Discrete Structures I

Discrete structures provide the theoretical foundations necessary for computation. These fundamentals are not only useful to develop computation from a theoretical point of view as it happens in the course of computational theory, but also is useful for the practice of computing; In particular in applications such as verification, cryptography, formal methods, etc.

1.3 QI0027. General Chemistry

This course is useful in this career so the student learns to show a high degree of mastery of the laws of General Chemistry

1.4 GH0005. Communication Laboratory I

Through this course, the student will improve and strengthen his abilities to communicate both oral and written in an academic context. To do this, the student will exercise in the composition of texts, taking into account the requirements of a formal academic language: characteristics of academic writing (rules of punctuation, spelling, grammatical lexical competence, normative) and correct use of information. In turn, the course promotes a comprehensive reading that is not limited to the descriptive level, but also encompasses the conceptual and metaphorical, because only in this way will the student develop his critical and analytical capacity. The student will take on academic readings and scientific outreach that will allow him to distinguish between the objectives set out in the different types of texts and to recognize the oral and written text as a coherent and cohesive unit in terms of form and content. Once these objectives have been achieved, the student will understand that oral and written communication skills are central competences of his / her university life and, later, his / her professional life.

1.5 EG0003. Mathematics I

The course aims to develop in students the skills to deal with models in science and engineering related to single variable differential calculus skills. In the course it is studied and applied concepts related to calculation limits, derivatives and integrals of real and vector functions of single real variables to be used as base

and support for the study of new contents and subjects. Also seeks to achieve reasoning capabilities and applicability to interact with real-world problems by providing a mathematical basis for further professional development activities.

1.6 EG0004. Global Challenges

During the plenary sessions, there will be lectures related to the methodology of Design Thinking as well as its use and importance in the creation processes. Also, during these sessions we will have presentations on entrepreneurs and startups related to engineering or technology. During lab sessions, students form teams that maintain during the cycle. With the guidance of the teacher and through the methodology of Design Thinking developed in the plenary sessions, students will have to present innovative solutions to real problems inspired by the United Nations "Global Challenges". The students will have a Digital Log which will be constantly reviewed by the teachers in charge. In it will be the advances, processes and referents of the group project. The course culminates with the presentations of the proposals put forward by the groups.

2.1 CS1102. Objects oriented programming I

This is the second course in the sequence of introductory courses in computer science. The course will introduce students in the various topics of the area of computing such as: Algorithms, Data Structures, Software Engineering, etc.

2.2 CS1D02. Discrete Structures II

In order to understand the advanced computational techniques, the students must have a strong knowledge of the Various discrete structures, structures that will be implemented and used in the laboratory in the programming language..

2.3 ME0019. Physics I

This course is useful in this career so that the student learns to show a high degree of mastery of the laws of the movement of General Physics.

2.4 GH0006. Communication Laboratory II

This laboratory is oriented to consolidate the student's communicative skills, both oral and written in the framework of the discipline under study. In particular, the student will strengthen his / her expositive abilities by exercising throughout the first part of the course in writing a type of text that will develop throughout his career as an engineer: laboratory reports. He will reflect on the rhetorical situation he faces when writing this type of text: who will be his reader, what is the communicative intention of that text and the subject on which he is writing. In a second part, the course is presented as a space for discussion about argumentative discourse and critical reading of argumentative texts, so that the student reflects, knows and uses the communicative tools to

produce formal argumentative texts. In this sense, the course is oriented towards the production Permanent written and oral texts, so that the student will participate not only in discussion forums but is expected to be able to discuss with his colleagues on a topic proposed by the teacher. In short, the course seeks to consolidate the skills of reading, analysis and preparation of written and oral texts, both expository and argumentative.

2.5 GH0007. Introduction to Business Development

This course aims to provide students with a real-life hands-on experience in the first steps within a business life cycle, through which an idea becomes a formal business model. It is the first of a set of three courses designed to accompany students as they transform an idea into a prospective business or business, from idea to review of current business strategy.

2.6 GH1002. Art and Technology

The course seeks to give a global, historical and critical vision of the transformations and synergies of contemporary art. Where students approach two components of contemporary art and design: interdisciplinary practices and points of contact between the arts and the technological and engineering processes.

2.7 EG0005. Math II

The course develops in students the skills to deal with models of science and engineering skills. In the first part of the course a study of the functions of several variables, partial derivatives, multiple integrals and an introduction to vector fields is performed. Then the student will use the basic concepts of calculus to model and solve ordinary differential equations using techniques such as Laplace transforms and Fourier series.

3.1 CS1103. Objects oriented programming II

This is the third course in the sequence of introductory courses in computer science. This course is intended to cover Concepts indicated by the Computing Curriculum IEEE (c) -ACM 2001, under the functional-first approach. The object-oriented paradigm allows us to combat complexity by making models from abstractions of the problem elements and using techniques such as encapsulation, modularity, polymorphism and inheritance. The Dominion of these topics will enable participants to provide computational solutions to design problems simple of the real world.

3.2 CS2201. Computer Architecture

It is necessary that the professional in Computer Science has a solid knowledge of the organization and operation of the various computer systems in which the programming environment is installed. This will also know how to establish the scope and limits of the applications that are developed according to the platform being used.

The following topics will be addressed: basic digital logic components in a computer system, design of instruction sets, microarchitecture of the processor and execution in pipelining, organization of memory: cache and virtual memory, protection and sharing, system I / O and interrupts, super-scalar architectures and out-of-order execution, vector computers, multithreading architectures, symmetric multiprocessors, memory and synchronization models, integrated systems and parallel computers.

3.3 CS2B01. Platform Based Development

The world has changed due to the use of fabric and related technologies, rapid, timely and personalized access to the information, through web technology, ubiquitous and pervasive; they have changed the way we do things, how do we think? and how does the industry develop? Web technologies, ubiquitous and pervasive are based on the development of web services, web applications and mobile applications, which are necessary to understand the architecture, design, and implementation of web services, web applications and mobile applications.

3.4 EN0021. Physics II

Show a high degree of mastery of the laws of wave motion, the nature of fluids, and thermodynamics. Using properly the concepts of wave movement, fluids and thermodynamics in solving problems of daily life. Possess ability and ability in the interpretation of wave, fluid and thermodynamic phenomena, which contribute to the development of efficient and useful solutions in different areas of computer science.

3.5 GH0008. Business Management

.

3.6 EG0006. Math III

This course introduces the first concepts of linear algebra as well as numerical methods with an emphasis on problem solving with the Scilab open source libe package. Mathematical theory is limited to fundamentals, while effective application for problem solving is privileged. In each subject, a few methods of relevance for engineering are taught. Knowledge of these methods prepares students for the search for more advanced alternatives, if required.

3.7 EG0007. Interdisciplinary Project I

Interdisciplinary Projects I is a course in which students work in teams in a research and development or entrepreneurship project, in order to propose a solution to a relevant problem. The development of the project focuses on the use of engineering, technology and computer science tools to propose solutions to technical, technological, scientific and / or social problems. The integration of Knowledge and multidisciplinary and interdisciplinary aspects is an essential element for the success of the project. Throughout the course, the student learns about the design process, to apply the contents of his career to a real context; To identify and acquire new relevant knowledge; And to collaborate interdisciplinarily. In this first course of Interdisciplinary Projects, the student is exposed to problems of moderate complexity, with low level of uncertainty in the problem and solution, and has the support and close supervision of the project advisor. The course emphasizes the development and reinforcement of effective communication and collaboration skills to foster the formation of high performance teams. It learns to manage projects, applying good practices and international standards.

4.1 CS2100. Algorithms and Data Structures

The theoretical foundation of all branches of computing rests on algorithms and data structures, this course will provide participants with an introduction to these topics, thus forming a basis that will serve for the following courses in the career.

4.2 CS2101. Theory of Computation

This course emphasizes formal languages, computer models and computability, as well as the fundamentals of computational complexity and complete NP problems.

4.3 CS2701. Databases I

Information management (IM) plays a major role in almost all areas where computers are used. This area includes the capture, digitization, representation, organization, transformation and presentation of information; Algorithms to improve the efficiency and effectiveness of accessing and updating stored information, data modeling and abstraction, and physical file storage techniques. It also covers information security, privacy, integrity and protection in a shared environment. Students need to be able to develop conceptual and physical data models, determine which (IM) methods and techniques are appropriate for a given problem, and be able to select and implement an appropriate IM solution that reflects all applicable restrictions, including Scalability and usability.

4.4 IN0054. Statistics and Probabilities

It provides an introduction to probability theory and statistical inference with applications, needs in data analysis, design of random models and decision making.

4.5 GH0009. Peru, industrial country?

The objective of this course is to situate the student within the history of the development of the Peruvian industry taking as a starting point the Agrarian Reform. During the course, the student is expected to manage to articulate the different Processes that have shaped the Peruvian industry today focusing especially on the extractive industries. It seeks that the student understands, as parts of a whole how the social and political conditions, Economic and geography of Peru have shaped our industrial development in the last 50 years. In terms of learning, the course must be able to develop in the student a more critical and complex narrative of scenarios such as Conga, Baguazo or informal mining. In terms of competencies, this course should focus on working the student's analysis and interpretation skills.

4.6 GH0011. Innovación y Desarrollo de Productos

This course is designed to provide students with a sound understanding of the innovation process within a company. It focuses on applying entrepreneurial innovation skills within a well-established company. This is known as Intrapreneurship. It's the third of a set of three courses designed to accompany students as they transform an idea into a prospective business or venture. The student will experience the process from the phase of ideation to reviewing current business strategies. The material seen in this course answers 2 main questions: What should you do? and How should you get it done?.

4.7 EG0008. Interdisciplinary Project II

Interdisciplinary Projects I is a course in which students work in teams in a research and development or entrepreneurship project, in order to propose a solution to a relevant problem. The development of the project focuses on the use of engineering, technology and computer science tools to propose solutions to technical, technological, scientific and / or social problems. The integration of Knowledge and multidisciplinary and interdisciplinary aspects is an essential element for the success of the project. Throughout the course, the student learns about the design process, to apply the contents of his career to a real context; To identify and acquire new relevant knowledge; And to collaborate interdisciplinarily. In this second course of Interdisciplinary Projects, the student is exposed to problems of moderate complexity, with low level of uncertainty in the problem and solution, and has the support and close supervision of the project advisor. The course emphasizes the development and reinforcement of effective communication and collaboration skills to foster the formation of high

performance teams. It learns to manage projects, applying good practices and international standards.

5.1 CS2102. Analysis and Design of Algorithms

An algorithm is, essentially, a well-defined set of rules or instructions that allow solving a computational problem. The theoretical study of the performance of the algorithms and the resources used by them, usually time and space, allows us to evaluate if an algorithm is suitable for solving a specific problem, comparing it with other algorithms for the same problem or even delimiting the boundary between Viable and impossible. This matter is so important that even Donald E. Knuth defined Computer Science as the study of algorithms. This course will present the most common techniques used in the analysis and design of efficient algorithms, with the purpose of learning the fundamental principles of the design, implementation and analysis of algorithms for the solution of computational problems

5.2 CS2702. Databases II

Information Management (IM) plays a leading role in almost every area where computers are used. This area includes the capture, digitization, representation, organization, transformation and presentation of information; Algorithms to improve the efficiency and effectiveness of access and update of stored information, data modeling and abstraction, and physical file storage techniques.

It also covers information security, privacy, integrity and protection in a shared environment. Students need to be able to develop conceptual and physical data models, determine which IM methods and techniques are appropriate for a given problem, and be able to select and implement an appropriate IM solution that reflects all applicable constraints, including scalability and Usability.

5.3 CS2901. Software Engineering I

The aim of developing software, except for extremely simple applications, requires the execution of a well-defined development process. Professionals in this area require a high degree of knowledge of the different models and development process, so that they are able to choose the most suitable for each development project. On the other hand, the development of medium and large-scale systems requires the use of pattern and component libraries and the mastery of techniques related to component-based design

5.4 CS2S01. Operating systems

An Operating System is a program that acts as an intermediary between the user and the machine.

The purpose of an operating system is to provide an environment in which the user can run their applications.

In this course the design of the core of the operating systems will be studied. In addition, the course includes practical activities in which problems of concurrency will be solved and the operation of a pseudo Operating System will be modified.

5.5 CS3402. Compilers

That the student knows and understands the concepts and fundamental principles of the theory of compilation to realize the construction of a compiler

5.6 GH0010. Ethics and Technology

This course seeks to provide students with certain frameworks with which to analyze the dilemmas that can be presented in their professional practice. The course puts in practice the critical and responsible reasoning of the students, being this a fundamental competence for the decision-making processes that we will assume as professionals and citizens.

5.7 EG0009. Interdisciplinary Project III

Interdisciplinary Projects I is a course in which students work in teams in a research and development or entrepreneurship project, in order to propose a solution to a relevant problem. The development of the project focuses on the use of engineering, technology and computer science tools to propose solutions to technical, technological, scientific and / or social problems. The integration of Knowledge and multidisciplinary and interdisciplinary aspects is an essential element for the success of the project. Throughout the course, the student learns about the design process, to apply the contents of his career to a real context; To identify and acquire new relevant knowledge; And to collaborate interdisciplinarily. In this third course of Interdisciplinary Projects, the student is exposed to problems of moderate complexity, with low level of uncertainty in the problem and solution, and has the support and close supervision of the project advisor. The course emphasizes the development and reinforcement of effective communication and collaboration skills to foster the formation of high performance teams. It learns to manage projects, applying good practices and international standards.

6.1 CS2301. Networking and Communication

The ever-growing development of communication and information technologies means that there is a marked tendency to establish more computer networks that allow better information management..

In this second course, participants will be introduced to the problems of communication between computers, through the study and implementation of communication protocols such as TCP / IP and the implementation of software on these protocols

6.2 CS3101. Competitive Programming

Competitive Programming combines problem-solving challenges with the fun of competing with others. It teaches participants to think faster and develop problem-solving skills that are in high demand in the industry. This course will teach you to solve algorithmic problems quickly by combining theory of algorithms and data structures with practice solving problems.

6.3 CS3102. Advanced Data Structures

Algorithms and data structures are a fundamental part of computer science that allow us to organize information in a more efficient way, so it is important for every professional in the area to have a solid background in this regard.

In the course of advanced data structures our goal is for the student to know and analyze complex structures, such as Multidimensional Access Methods, Space-Time Access Methods and Metric Access Methods, etc.

6.4 CS3903. Information systems

Analyze techniques for the correct implementation of scalable, robust, reliable and efficient information systems in organizations.

6.5 FG601. English for STEM

.

6.6 GH0012. Developing Economies

This course seeks to introduce the student to the general concepts of microeconomics and macroeconomics. The goal is for students to be able to explain processes of reality from the logic of economics. After having completed the micro and macroeconomics modules, students must choose one of the two proposed elective tracks. The elective tracks are i) cases of fast-growing economies and dramatic recessions and ii) public policies for poverty reduction in Latin America. The idea is that students can choose between two options that allow them to analyze concepts of economics applied to reality. In terms of contents, the student must have a clear understanding of the general concepts and topics that make up macro and microeconomics. Concerning the competencies to be worked on in this course, the student is expected to be able to apply theoretical concepts to the analysis of cases

6.7 GH0015. Image and personal brand

The preparation course for pre-vocational practice I is the first of two courses in the area of personal and professional competence development. This course provides Opportunity for the student to self-assess and recognize the opportunities for improvement, to feel capable of accomplishing each of the challenges

proposed to him at the Personal and professional and to carry out an adequate analysis of their situation, execution and proposed resolution. Learning through experience will help you to evaluate from your own perspective, different ways of thinking and the ability to contribute individually or as a team to the achievement of a specific goal; Through the exchange of ideas, the Evaluation of proposals and the execution of the ideal solution alternative.

7.1 CS2H01. Computer Human Interaction

Language has been one of the most significant creations of humanity. From body language and gesture, through verbal and written communication, to iconic symbolic codes and others, it has made possible complex interactions Among humans and facilitated considerably the communication of information. With the invention of automatic and semi-automatic devices, including computers, The need for languages or interfaces to be able to interact with them, has gained great importance. The utility of the software, coupled with user satisfaction and increased productivity, depends on the effectiveness of the User-Computer Interface. So much so, that often the interface is the most important factor in the success and failure of any computer system. The design and implementation of appropriate Human-Computer Interfaces, which in addition to complying with the technical requirements and the transactional logic of the application, consider the subtle psychological implications, sciences and user facilities, It consumes a good part of the life cycle of a software project, and requires specialized skills, both for the construction of the same, and for the performance of usability tests.

7.2 CS3P01. Parallel and Distributed Computing

The last decade has brought explosive growth in computing with multiprocessors, including Multi-core processors and distributed data centers. As a result, computing parallel and distributed has become a widely elective subject to be one of the main components in the mesh studies in computer science undergraduate. Both parallel and distributed computing the simultaneous execution of multiple processes, whose operations have the potential to intercalar in a complex way. Parallel and distributed computing builds on foundations in many areas, including understanding the fundamental concepts of systems, such as: concurrency and parallel execution, consistency in state / memory manipulation, and latency. The communication and coordination between processes has its foundations in the passage of messages and models of shared memory of computing and algorithmic concepts like atomicity, consensus and conditional waiting. Achieving acceleration in practice requires an understanding of parallel algorithms, strategies for decomposition problem, systems architecture, implementation strategies and analysis of performance. Distributed systems highlight the problems of security and tolerance to Failures, emphasize the maintenance of the replicated state and introduce additional problems in the field of computer networks.

7.3 CS2501. Computer graphics

It offers an introduction to the area of Computer Graphics, which is an important part of Computer Science. The purpose of this course is to investigate the fundamental principles, techniques and tools for this area.

7.4 CS2601. Artificial intelligence

Research in Artificial Intelligence has led to the development of numerous relevant topics, aimed at the automation of human intelligence, giving a panoramic view of different algorithms that simulate the different aspects of the behavior and the intelligence of the human being.

7.5 CS2902. Software Engineering II

The topics of this course extend the ideas of software design and development from the introduction sequence to programming to encompass the problems encountered in large-scale projects. It is a broader and more complete view of Software Engineering appreciated from a Project point of view.

7.6 AM0037. Science of Materials

The introduction and innovation of this course begins with the selected presentation of the general fundamentals on Materials Science and Engineering. Then, it focuses on seminars on the family of materials: metals and alloys, ceramics and glass, polymers and copolymers, and composites and nanomaterials. Applications encompass traditional and state-of-the-art materials. The study of these applications covers the role played by the materials, the same applications and their relevance. Advanced cases on materials and innovative applications of potential relevance on the Peruvian context are covered.

7.7 GH0013. Critique of Modernity

The preparation course for pre-vocational practice I is the first of two courses in the area of personal and professional competence development. This course provides Opportunity for the student to self-assess and recognize the opportunities for improvement, to feel capable of accomplishing each of the challenges proposed to him at the Personal and professional and to carry out an adequate analysis of their situation, execution and proposed resolution. Learning through experience will help you to evaluate from your own perspective, different ways of thinking and the ability to contribute individually or as a team to the achievement of a specific goal; Through the exchange of ideas, the Evaluation of proposals and the execution of the ideal solution alternative.

7.8 GH0014. Cultures of governance and distribution of power

The objective of the course is for the student to understand the interrelation that exists between political and economic systems of a country or region. The thread of this course will be the book “Why Nations Fail: The Origins of Power, Prosperity, and Poverty” by Acemoglu-Robinson. At the end of the course, students must have learned an informed interpretation of different social dynamics through which power is organized and distributed, be it of a symbolic, economic and/or political nature. This course aims to train the student’s ability to use more complex concepts and to develop more elaborate interpretations of reality.

8.1 CS3909. Pre Professional Project

This course aims to learn how to make a research of a scientific nature in the area of computing. The course teachers will determine a study area for each student, and will be given bibliography to analyze and from the same, and additional bibliographic sources (investigated by the student), the student should be able to construct an article of the Type survey of the assigned topic.

8.2 CS4002. Capstone Project I

This course aims to allow the student to carry out a study of the state of the art of a topic chosen by the student for his thesis.

9.1 CS3700. Big Data

Nowadays, knowing scalable approaches to processing and storing large volumes of information (terabytes, petabytes and even exabytes) is fundamental in computer science courses. Every day, every hour, every minute generates a large amount of information which needs to be processed, stored, analyzed.

9.2 CS3I01. Computer Security

Nowadays, information is one of the most valuable assets in any organization. This course is oriented to be able to provide the student with the security elements oriented to protect the Information of the organization and mainly to be able to foresee the possible problems related to this heading. This subject involves the development of a preventive attitude on the part of the student in all areas related to software development.

9.3 CS4003. Final Project II

This course aims at the student to conclude his thesis project.

9.4 CS3501. Topics in Computer Graphics

In this course you can delve into any of the topics Mentioned in the area of Graphics Computing (Graphics and Visual Computing - GV).

This course is designed to perform some advanced course suggested by the ACM / IEEE curriculum. [?, ?]

9.5 CS3602. Robotics

That the student knows and understands the concepts and fundamental principles of control, road planning and the definition of strategies in robotics as well as concepts of robotic perception in a way that understands the potential of robotic systems

9.6 CS3901. Software Engineering III

Software development requires the use of best development practices, IT project management, equipment management And efficient and rational use of quality assurance frameworks, these elements are key and transversal during the whole productive process. The construction of software contemplates the implementation and use of processes, methods, models and tools that allow to achieve the realization of the quality attributes of a product.

9.7 BI0021. Bioinformatics and Biostatistics

The use of computational methods in the biological sciences has become one of the key tools for the field of molecular biology, being a fundamental part of research in this area.

In Molecular Biology, there are several applications that involve both DNA, protein analysis or sequencing of the human genome, which depend on computational methods. Many of these problems are really complex and deal with large data sets.

This course can be used to see concrete use cases of several areas of knowledge of Computer Science such as Programming Languages (PL), Algorithms and Complexity (AL), Probabilities and Statistics, Information Management (IM), Intelligent Systems (IS).

9.8 FG602. Business Communication

.

9.9 GH0016. Leadership and Negotiation

This course is designed to help students to develop skills related to leadership, as well as to introduce them to the essential elements of a negotiation, in order for them to gain experience and confidence to function well in their work environments. The aim of the course is to train students in the necessary tools to

become integer and resolute professionals that are capable of facing individual and collective challenges. Learning takes place through experience and critical thinking. To do this, students will be exposed to different subjects and activities that allow different ways of thinking and decision making. Always on the basis of three axes: ethical rules, constant self-evaluation and the planning of activities.

10.1 CS3P02. Cloud Computing

In order to understand the advanced computational techniques, the students must have a strong knowledge of the various discrete structures, structures that will be implemented and used in the laboratory in the programming language.

10.2 CS3P03. Internet of Things

The last decade has an explosive growth in multiprocessor computing, including multi-core processors and distributed data centers. As a result, parallel and distributed computing has evolved from a broadly elective subject to be one of the major components in mesh studies in undergraduate computer science. Both parallel computing and distribution involve the simultaneous execution of multiple processes on different devices that change position.

10.3 CS4004. Final Project III

This course aims to enable students to complete properly their draft of thesis.

10.4 GH0017. Introduction to Quechua

The Quechua communicative course allows students to approach the practical use of the Andean language in their Chanca variety. This is one of the varieties of greater diffusion and model to approach other varieties of denominated Quechua southern or Quechua II. In addition, it is simple in its learning to share sounds with Castilian. Also, the course seeks to familiarize the student with the basic structures of this language, as well as with the translation and production of texts. The ultimate goal is to provide the basic learning tools so that the student can express himself at a basic and functional level, as well as lead and develop his own language learning. We believe that speaking Quechua in certain situations where UTEC engineers have to develop is a very important advantage: native Quechua speakers practice a differentiated treatment with people who speak it because they feel that their tradition is being respected and, at the same time, Making an effort to engage in dialogue in their own language. This represents very specific operational advantages in the treatment and the agreement of interests.

10.5 GH0019. Entrepreneurs in Action

The purpose of this course is for students to acquire the specific tools and knowledge to perform a market analysis that will be reflected in: (i) a business

plan; And (ii) the development of leadership skills, teamwork and effective communication. This will be achieved by working together with an entrepreneur, bringing the student to the daily problems that arise in the enterprises. This course is mostly practical, where what is learned in the classroom will be used to analyze the market together with the entrepreneur, following the structure of a business plan. Thus, the student will apply this knowledge and acquired during his career, always guided by the teacher and helpers. On the one hand, the student will be connected with a real case of entrepreneurship, so that he / she learns by means of the technique "learning by doing". On the other hand, an attempt will be made to reduce the failure rate of entrepreneurs (according to Small Business Administration [<http://www.sba.gov>]), 95 percent of entrepreneurs fail before the fifth year, mainly due to lack of differentiation With competition and lack of an effective marketing strategy). The entrepreneurs who will be advised in the Applied Entrepreneurship course belong to Fundación Independízate (www.fundacionindependizate.cl), and they are people with a technical or professional level who know a lot about their product but who have failures in market analysis and strategies Sales and marketing.

10.6 GH0020. Behavioral Economics

.

10.7 GH0021. Fiction Design

El curso de Imagen y Marca Personal , es el primero de dos cursos del área de desarrollo de competencias personales y profesionales. Este curso brinda oportunidades al estudiante para que se autoevalúe y reconozca las oportunidades de mejora, sentirse capaz de realizar cada uno de los retos que se le proponga a nivel personal y profesional y de realizar un adecuado análisis de su situación, ejecución y propuesta de resolución. El aprendizaje a través de la experiencia, le ayudará a evaluar desde su propia perspectiva, las diferentes formas de pensar y la capacidad de aportar individualmente o en equipo al logro de un determinado objetivo; a través del intercambio de ideas, la evaluación de propuestas y la ejecución de la alternativa de solución idónea.