SECTOR:
COMMERCIAL AND SERVICES

PROGRAM
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

CURRICULAR DESIGN ON COMPETENCY BASED-EDUCATION

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Program approved by the "Consejo Superior de Educación" in session _____, act _____ from _____

San José – Costa Rica

SECTOR:
COMMERCIAL AND SERVICES

PROGRAM:
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

TWELFTH GRADE

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May, 2011

Corrections were made in this study program in September 2011, according to session 28-2011, act 03-28-2011 from August 8th, 2011

Contents

ACKNOWLEDGEMENTS

The Ministry of Public Education and the Department of Technical Education deeply appreciate the valuable contributions of many professionals who gave advice on the development of this study program.

In particular, we appreciate the contribution of MSc. Vanessa Gibson, coordinator of *Coordinación de Iniciativas para el Desarrollo* (Initiative Development Coordination) at CINDE for her support in the development of this study program that will be taught by Computer Science teachers.

Special thanks to the Volunteering Program for Retired Professors from Massachusetts Institute of Technology (MIT), mainly to Ms. Seymour and Mr. Cameron Smith for their suggestions and translations.

We also are grateful to Ms. Norma S. Merrett and Mr. Perry Miller for their work and recommendations in proofreading this program, and particularly for encouraging English Technical Advisors to the best we can be as professionals in our jobs.

Finally, special thanks to Costa Rica Multilingüe for its efforts to encourage Costa Ricans to communicate in many languages, and to make the concept of “multilingual” a reality in our country.

This program will increase the potential for success of the Technical and Professional High Schools preparing students for job opportunities after graduation and will expand the possibilities for rewarding careers for the graduates of these schools.

Presentation of Fundamentals

In these times the access to information and its efficient use is the most important factor in determining the performance on the personal level and its organization. Starting from this point we can implement a strategy-definition process and make realistic and successful decisions according to developmental requirements of our environments.

In this context the use of information technologies takes on strategic importance in many public and private organizations for their impact on the quality of productivity and services and in competitive growth.

Clearly, the effective use of technology has an important effect on our country's productive, economic and social sectors. Thus, we are promoting the introduction of technology in activities related to performance by providing developmental factors and fundamental tools for attaining these goals.

Naturally, in order to develop the full potential offered by these technologies with its resulting momentum, it is necessary to train our population to a high level in accordance with our labor and management marketing requirements.

It should be pointed out the remarkable growth of our nationally installed technology base creates new information-technology workforce requirements. The demand for specialists in maintenance and updating is evident from technical support levels, resulting from growth in coverage and access to these technologies, to management and entrepreneurs.

The Ministry of Public Education, specially the Department of Technical Education, addresses new requirements in its sub-system which offers training to capable medium-level technicians. Starting from the principle that education is the fundamental instrument for developing useful citizens, the program increases the supply of technical specialists and includes information technology in computer networking.

Therefore, in accordance with the educational policy we aim to:

- Strengthen the fundamental values of the Costa Rican society through the integral formation of students.
- Stimulate respect for cultural, social and ethnic diversity.
- Build awareness in future citizens of their commitment to sustainable development in the national economy

and society, in harmony with the environment.
- Develop a workforce that contributes to Costa Rica´s competitiveness internationally.

To respond to these objectives, various information technical programs were developed. All of them have a curricular structure and a study program. These conform to subject areas which are integrated and organized so that they let the student develop knowledge, abilities and skills. This process allows the student to take an active part in building her/his own knowledge.

In addition to the technical programs' specific contents, we include study blocks of:

- Occupational health: This includes basic contents covering work security and hygiene, plus ways to prevent and control work risks and accidents.
- Entrepreneurial management: This promotes development of knowledge, abilities and skills that permit conversion into single or joint management, such that they not only prepare to perform as employees, but also that they can form their own companies.
- Quality culture: This permits the student to build knowledge and skills necessary to continuous quality improvement processes in various performance tasks, such as a mechanism to grow competitiveness. Also customer service elements are included in this program.

This specialty was designed in the format of competency-based education. This program was approved by the "*Consejo Superior de Educación"* in session 05-2009, act 03-05-09 from 29-01-2009. Some subject-areas were translated, taking into account the following percentages to be given in English in each grade:

- In tenth grade, 60% of content in subject areas delivered in a second language.
- In eleventh grade, 80% of content in subject areas delivered in a second language.
- In the twelfth and final grade, 100% of content in subject areas delivered in a second language.

RATIONALE

COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

Technology is one of the areas that has experienced exponential growth, leading to constant modifications not only in its structure, but also in its aims. Constant innovation in this field has influenced all elements of our social, economic and cultural lives.

These factors affect the concept that economic players have about the knowledge, abilities and skills that human resources require to develop productive processes, including quality, competitiveness and productivity, which are not only institutional goals but also intrinsic values.

In particular, the above idea applies to the field of computer science, transforming it into a dynamic one by constantly introducing new work tools. New equipment and devices appear in the market weekly or monthly, with frequent upgrades. This continuous change demands high adaptability of the educational sector.

Responding to these new demands and constant technological changes, this study program includes methodological strategies in design and content, emphasizing fundamental principles, paradigms and conceptual elements rather than tools to develop them. In this way, adaptations and upgrades will emerge in a more efficient and faster way, allowing these specialties to respond to the market.

A new upgraded proposal is presented in Computer Science:

- English for communication: its goal is to develop student knowledge, abilities and skills for the interpretation and understanding of technical language associated with the specialty; this subject-area will be taught in English only.
- Information and Communication Technologies: includes necessary elements to develop knowledge, abilities and skills to prepare the expert user of these technologies. Some aspects are: hardware, software, Internet, databases, specialized systems of information and connectivity with mobile equipment.

- Graphical User Interfaces: integrates the following study units of designing principles: Theory of Color, Typographic Design, Artistic Composition, Digital Design, Digital Photographs, Design of Corporate Identity and Graphical User Interface.

The mid technician in Software Development should know about all the possible paradigms, as well as develop abilities and skills to use different programming languages. Mastering programming in different working atmospheres is mainly important for the student´s performance in any work field.

CROSS CURRICULAR THEMES

The social, economic, cultural, scientific, environmental and technological world today has demanded that the school curriculum not only provide knowledge and information, but also promote the development of values, attitudes, abilities and skills aimed at improving the quality of lives of individuals and societies (Marco de Acción Regional de "Educación para Todos en las Américas", Santo Domingo, 2000). However, there is in our education system, a real difficulty teaching new subjects and contents related to emerging and relevant issues of society because there is a risk of saturation and fragmentation of the curriculum.

An alternative to these limitations are the cross-curricular themes, which is understood as an "educational approach that takes advantage of the opportunities offered by the curriculum, incorporating in the design, development, assessment and curriculum management some lessons for life, overarching and significant, aimed at improving the quality of individual and social life. They are holistic, axiomatic, interdisciplinary and in context "(Comisión Nacional Ampliada de Transversalidad, 2002).

According to the guidelines issued by the Consejo Superior de Educación (CSE) (SE 339-2003), the only Costa Rican Cross- Curricular axis are those of values. Thus, the systematic approach of Values in the national curriculum aims to promote the socio-emotional and ethical development of students, starting from the humanist position expressed in the "Política Educativa y la Ley Fundamental de Educación".

Starting from the values and obligations of the State based on legislation in Costa Rica, we have defined the following Cross- Curricular Themes: **Environmental Culture for Sustainable Development, Integrated Sexual Education, Health Education, and Education Experience of Human Rights for Democracy and Peace.**

For each cross- curricular theme we have defined a set of skills students develop in the area over the period of educational training. The competencies are understood as: "An integrated set of knowledge, procedures, attitudes and values, which allows satisfactory individual performance in the face of specific situations of personal and social life" (Comisión Nacional Ampliada de Transversalidad, 2002). They should guide the educational process and the very development of Cross -Curricular themes.

From the pedagogical viewpoint Cross- Curricular Themes are defined mainstreaming as: "Those that pass through and permeate both horizontally and vertically, all subjects in the curriculum and are required for their development integrated and coordinated contributions of different disciplines of study and joint educational action "(Beatriz Castellanos, 2002). In this way, they are present in the annual programs; as well as, throughout the entire educational system.

The following is a summary of each cross-curricular theme approach and its respective competencies:

Environmental Culture for Sustainable Development

Environmental education is considered the ideal instrument for the construction of a culture of people and societies, in terms of achieving sustainable human development; through a process that allows them to understand their interdependence with the environment, from a critical and reflective awareness of reality.

Taking into account the knowledge gained, and activities of appreciation and respect, the students will draw from the reality, thus, causing active participation in the detection and resolution of problems at the local level, without ruling out a global vision.

Competencies to develop:

- Apply knowledge gained through critical processes reflective of reality, the resolution of issues (environmental, economic, social, political, and ethical) in creative ways and through attitudes, practices and values that contribute to sustainable development and better quality of life.
- Participate in committed, active and responsible projects aimed at the conservation, restoration and protection of the environment, identifying their main problems and needs, creating and developing alternative solutions to help improve the quality of life and the sustainable development.
- Practice harmonious relationships with one`s self, others and other living beings through responsible attitudes and skills, recognizing the need for interdependence with the environment.

Integral Sexual Education

From the document "Políticas de la Educación de la Expresión de la Sexualidad Humana" (2001), a mature experience of human sexuality requires a comprehensive education and cannot be reduced to biological reproduction, or placed in a context devoid of values, ethical principles, moral life, love, and family and coexistence.

Human sexual education starts from early childhood and continues throughout life. In the first place, it is the right and the duty of the parents. It is up to the state to take subsidiary action to improve in the field of education and information, as expressed in Código de la Niñez y la Adolescencia (the Code of Childhood and Adolescence).

The education system must ensure experiences and teaching strategies that respond to the potential of the student population in accordance with their stage of development and socio-cultural contexts.

Competencies to develop:

- Interact with men and women equally, supportive and respectful of diversity.
- Make decisions concerning their sexuality from a life plan based on critical understanding of themselves, their socio-cultural reality and ethical and moral values.
- Identify appropriate internal and external resources when faced with signs of harassment, abuse and violence.
- Express your identity with authentic, responsible and comprehensive actions by encouraging personal development in a context of ongoing interaction and expression of feelings, attitudes, thoughts, opinions and rights.
- Promote constructive thought processes within the family, which dignifies the human condition, identifies and proposes solutions according to the socio-cultural context.

Health Education

Health education is a fundamental right of children and adolescents. Health status is related to school performance and quality of life. So to work in health education in schools, according to the needs of the student population at each stage of development, citizens are being educated about healthy lifestyles, therefore, people who build and seek healthy lifestyles, have quality of life for themselves and for those around them.

The health education should be a social process to organize, and systematically motivate and guide individuals to develop. This will enhance, modify and encourage those that are the most practical and healthy people; as well as, the relationships with others and their environment.

So health education in the school setting is not limited only to convey information, but seeks to develop knowledge, skills and abilities that contribute to the social production of health, by teaching in a learning environment which tends toward a two-way communication and critical participatory students.

Competencies to develop:

- Experience a lifestyle that allows you to critically and reflectively maintain and improve the overall health and quality of one´s life and that of others.
- Make decisions that support overall health of one´s self and that of those around him/her, by better knowledge of himself/herself and others and the surrounding environment.
- Choose a process of critical self- appraisal, best- suited to deal with all situations which will encourage a safe environment for overall health of self and others.
- Use responsible, critical and participatory services available in the health sector, education and community, to make commitments on behalf of their quality.

Experience of Human Rights Democracy and Peace

Costa Rica is a consolidated democracy, but in a constant state of review and feedback, making the observance of human rights is inherent in the commitment to build a culture of peace and democracy.

In educational settings use of appropriate management mechanisms will promote genuine participation in the family, community, institutional and national levels. To this end, civil society must be informed and educated regarding the legal framework provided by the country. This will develop effective participation and increase their participation in the electoral actions. This should provide a model democratic system which makes citizenship an attractive and interesting activity involving civic rights and responsibilities.

Competencies to develop:

- Practice daily duties and responsibilities which are deserving of human beings. These are based on a democratic, ethical, tolerant and peaceful environment.
- Emphasize the rights and responsibilities of citizenship.
- Choose alternative personal, family and social life that might promote tolerance, justice and equity between genders according to the contexts in which they operate.
- Participate in inclusive actions for the equity in all cultural contexts.
- Exercise the rights and responsibilities associated with democratic principles for the culture of peace.
- Show tolerance in order to accept and understand the cultural, religious and ethnic possibilities which are conducive and coexistence in a democratic culture of peace.
- Assess the cultural differences of different lifestyles.
- Practical actions, attitudes and behaviors directed to non-violence in schools, through work with groups of parents, family and citizens. Do this through conflict resolution, other peaceful means and expression of affection, tenderness and love.
- Apply strategies for peaceful resolution of conflicts in different contexts.
- Respect individual cultural, ethical, social, and generational differences.

Methodological approach of the Cross – Curricular Themes in the Study Programs and Planning

Cross- Curricular Themes should be evident during the teaching –learning process in the National Education System from the study programs to the planning.

Regarding to curricula display values that promote, specifically, the incorporation of Cross-Curricula Themes. However, the options for convergence are not limited to those mentioned in the program. The students and the teachers can identify other possibilities to develop cross-curricular themes.

In this case, the teacher must be able to identify from students' prior knowledge, the socio-cultural context, the relevant and current society events which program objectives represent opportunities to address cross-curricular themes.

The Cross-Curricular Themes should be displayed in planning ; specifically, in the teaching /learning strategies and Values and Attitudes columns. The application of Cross-curricular themes in the classroom should consider the students` characteristics and environment details to achieve more meaningful learning.

Further than teacher´s planning, the educational institution should take actions to integrate Cross–Curricular Themes into the institutional plan, promoting active participation, critical and reflective thinking of the parents and caregivers, community leaders, and the community education.

In this sense, the school must take the corresponding decisions to ensure consistency between daily institutional practice and the Cross–Curricular Themes becoming a critical challenge for every educational institution.

CROSS-CURRICULAR THEMES COMMITTEE

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TEACHING GUIDELINES

This study program adds value to the student's lives. Its program structure explains the contents to be developed in each subject area and every study block. This will be helpful to teachers organizing the process of developing the student´s knowledge both in or out of the classroom. While teachers may make additions to the content of the programs, they should not eliminate any, so that all Technical Schools may offer equal opportunities to learn.

Learning results included in this program are general in nature in order to give teachers the opportunity to add more specific information to their planning which must be consistent with the program. Learning results should reflect behavioral changes, knowledge, values, attitudes, skills and abilities which the student must master in the short term, either daily or weekly.

Teaching and Learning Strategies allow teachers to use their creativity and expertise in choosing the most appropriate strategy for the best learning results. Teaching and learning strategies are a point of departure for teachers who may then consider more appropriate ones, remembering that their strategies should facilitate learning by developing student thought process. The application of cognitive strategies, including comparison, classification, organization, interpretation, implementation, testing, analysis, identification, discussion, synthesis, evaluation, problem solving contribute to shape a critical and analytical student.

A checklist is included to determine basic elements that students must master upon completion of each study block.

Performance Criteria assess competency which leads to measurable evidence through observation of the student. Achieving these will allow the teacher to monitor and give individual feedback about learner´s progress. These criteria which reflect the expected result of each study block, are the basis for theoretical or performance testing.

The beginning of each study block establishes an estimated time for the program. This time allocation is flexible and teachers are free to add or subtract hours, based on their experience and using appropriate teaching procedures without affecting the in-depth study of the material.

Values and Attitudes which are specified in each study block can be shared with the students at the beginning of the school day. These might include learning experiences such as case studies, projects to illustrate values by living them.

According to the competency–based educational framework, the teaching-learning process aims at providing knowledge, develop skills and abilities in order to improve students´ attitudes and skills. The following teaching and learning steps should be taken into account:

- Identify and asses students´ learning needs (diagnostic evaluation)
- Identify learning results and assessment criteria.
- Plan teaching-learning strategies to be developed, based on student profile and content.
- Design and implement appropriate assessment rubrics.
- Evaluate and give feedback on the teaching process (formative and summative evaluation)

A teaching- learning strategy is a means to achieving learning results using a specific methodology. Strategies include material, technical and human resources which together to content promote students´ learning.

Strategy, moreover, provides the link between the content to be taught and the learning expected of the student. At the same time, it gives teachers the opportunity to measure the actual learning results. Therefore, it´s a priority to define the method before defining the strategy. As strategies are complementary to each other, their results should be consistent with the method used.

Competency- Based Education defines basic concepts related to the educational and must be taught according to this new methodological approach:

- Teaching should be based on creating an educational environment that:

recognizes students´ previous knowledge.

is based on cognitive and metacognitive strategies.

accomplishes complete and complex tasks.

- Learning takes place through:

gradually building knowledge.

the relationship between prior knowledge and new information.

meaningful organization of knowledge for the student.

Thus, **General Recommendations** assist in achieving program learning results and purposes:

- The Technical High School which teaches must provide adequate infrastructure, equipment and materials.
- To teach effectively, the teacher must be able and willing to upgrade.
- Both inductive and deductive processes must be developed in the study block, using attractive and dynamic teaching techniques to motivate students to achieve their goals. These techniques, which have been planned and oriented by the teacher, include discussions individual and team work, and searching for information.
- Encourage students to make use of magazines, newsletters and other printed material in order to acquire up-dated information and reading matter.
- Internships are essential in eleventh grade for the fulfillment of the teaching-learning process and must be planned according to the program contents or as a teacher deems necessary in order to establish a relationship with the local area businesses.
- Educational tours are necessary in tenth grade for learning results in the study block. Nevertheless, the teacher is in charge of deciding when to take students out of school.
- It is important for the teacher to be aware of the correspondent use of tools and working habits in the laboratory, workshop and in the classroom.

- Basic technical literature for each subject area of the three grades.

- All subject area teachers must provide necessary tools to solve problems in order to create analytical men and women who will be able to provide solutions and alternatives.

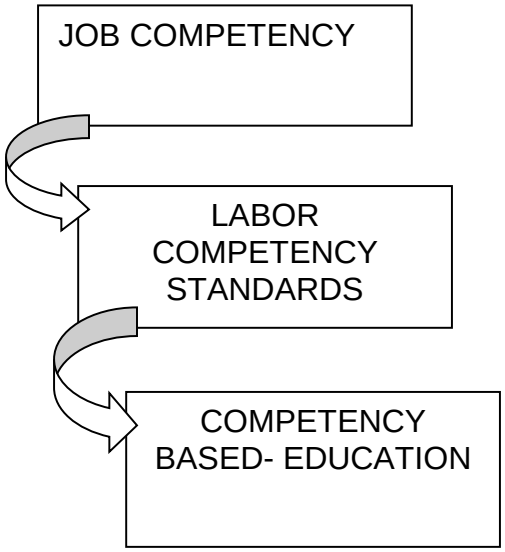
- The time allotted to practice and theory must be evenly distributed in accordance with the learning results to be developed.

- Workshops or labs relevant to the subject areas of each program.

- An up-to-dated computer lab with correspondent software based on the requirements of the labor market.
- Provide manual, catalogs and technical literature in English to be consulted by students.
- It is essential to make good use of technological devices such as audiovisual equipment, available material on Internet and others.
- This program should stimulate students´ creativity through developing specific projects associated with its contents.
- Teacher should ensure equipment and tool-maintenance, and report regularly to the Principal or Technical Coordinator to make the arrangements for technician assistance.

COMPETENCY BASED EDUCATION [1]

Competency-Based Education is a learning model that promotes the individual's integral and harmonic development and empowers students in all the competencies which the student needs to be successful in a specific activity. In this way, our student´ s needs are filled and also the requirements of the economic sectors.



Group of abilities, knowledge, attitudes and necessary skills to carry out a specific job.

Quantitative criteria for a worker´s skills to enable the performance of a function or a task within a specific labor position.

Integral training process aimed at the development of the capacities or the individual's competencies according to current norms of an economic and productive activity.

A competency refers to the performance of an activity that includes cognitive and psychomotor abilities, or socio-affective, which are necessary to carry out this activity that belongs to a personal, social or professional group.

From the perspective of the Competency- Based Education, academic training aims at the development of personal attributes and applying them in an intelligent way in work tasks, allowing him/her to transfer this competency to different contexts and work situations.

[1] Ávila, Gerardo y López, Xinia. Educación basada en normas de competencia. SINETEC. 2000.

Comparison between Technical Traditional Education And Competency- Based Education [2]

Technical Traditional Education	Competency- Based Education
The traditional pattern of learning responds to the needs of productive highly specialized processes.	The student adapts easily to different forms of production organization, including those used by the traditional style.
The contents of programs are highly academic. The link to the needs of the productive sector is neither systematic nor structured.	The productive sector establishes the results that the student expects to obtain from training, yielding norm-based system of job competency.
The programs and courses are inflexible.	Programs and courses are structured in subject-areas based on standard-based systems, allowing students to progress gradually and acquire levels of advanced competency.

Source: Morfín, Antonio. La nueva modalidad educativa: Educación basada en normas de competencia.

[2] Ávila, Gerardo y López, Xinia. Educación basada en normas de competencia. SINETEC. 2000.

ASSESSMENT GUIDELINES

In the educational context in general, and particularly in the educational framework Competency-Based Education, evaluation is a continuous and permanent process and an integral part of the teaching learning process. For that reason, the following aspects can be taken into account:[3]

Performance evaluation is a process requiring evidence and criteria about the level and nature of the achievement of performance requirements established in Learning Results or in Labor Competency Standards. At the same time the criteria determines if a person achieves the competency or not.

In the context of Competency-Based Education evaluation of students follows Learning Results, then evaluation of the competency is focused on the performance. For this purpose, the teacher should collect evidence to determine if the student has accomplished the required knowledge, ability or skills.

From this previous idea, it follows that evaluation is the main aim of Competency-Based Education, which identifies strengths and weaknesses, not only from the students learning process, but also from the same teaching learning process in general, and all aspects that influence it: the teacher, learning atmosphere, strategies, materials, resources, among others.

Competency by itself is not observable, and it has to be inferred starting from performance. Therefore, it is important to define the type of performance that will allow gathering evidence of quantity in enough quality to make reasonable judgements on the individual's performance. The evaluation process deals with observation, gathering and interpreting evidence which later will be compared to the performance criteria of technical norms in a job competency. This comparison is the base that allows inferring whether the student is competent or not.

In this way, Competency-Based Education evaluation uses performance criteria based upon the norm helping to determine the quantity and quality of the required evidence to be able to assess the individual´s performance. Thus, the evaluation process comprises the following sequence of activities:

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[3] Ávila, Gerardo y López, Xinia. Educación basada en normas de competencia. SINETEC. 2000.

- Define requirements or evaluation objectives.
- Collect evidence.
- Compare evidence with the requirements.
- Assess based on this comparison.

This leads to a continuous learning process that guides a new development process and evaluation. It is not necessary to collect evidence of students acquired knowledge (learning to know), but rather the actual performance that he/she achieves (learning to do).

The recommended methods of evaluation based on competency standards are the following:

- Observation performance.
- Simulation exercises.
- Designing projects.
- Written or oral tests.
- Performance tests.

Another technique used for assessment is the of "Portfolio of Evidence" used as part of the teaching-learning process.

Competency-Based Education, is a technique or strategy to gather evidence of *knowledge, performance and product* which are shown and confirmed during the learning process. The Portfolio of evidence developed by a student aims at quantifying the progress as a function of acquisition of competencies.

The technique allows the teacher to collect evidence and compare evidence with the requirements and assess them.

It is the student's responsibility to organize the portfolio, with the teacher ´s guidance and orientation. Some guidelines for building the portfolio are in Annex 1 of this document.

TEACHERS PLANNING

1. ANNUAL PLAN FOR SUBJECT-AREA

This timeline comprises a distribution of months and weeks for the annual course, which will be used in the development of study blocks of each subject-area and their respective learning results. For its development, the following criteria should be taken into account:

- Emphasize the values and attitudes that will be part of this subject-area during the course.
- Show the amount of hours per study block that make up the subject-area and its logical sequence.
- Provide a list of materials and or equipment to be provided by the institution for the program development.
- "This plan must be delivered to the Principal at the beginning of the school year."

Scheme for Annual Plan

ANNUAL PLAN

Technical High School: _____

Program: Computer Science in Software Development	Subject-area:	Grade: Twelfth
Teacher:		Year:
Values and attitudes:		

Learning Results / Study Block	FEB.				MARCH				APRIL				MAY				JUNE				JULY				AUG.				SEPT.				OCT.				NOV.				DEC.			HOUR
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	
Material and Equipment required:																																												

2. PEDAGOGICAL PRACTICE PLAN FOR THE EDUCATIONAL SUBJECT-AREA.

This plan must be made for each study block. It is used daily and must be delivered to the Principal who evaluates the needs of checking it. This plan should correspond to the annual plan prepared at the beginning of the school year. This is the official format for planning:

Pedagogical Practice Plan

Technical High School:		
Sector: Comercial And Services	Program: Computer Science in Software Development	
Subject Area:	Year:	Grade: Twelfth
Study Block:	Time:	
Purpose:		

LEARNING RESULTS	CONTENTS	TEACHING – LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA	TIME

Learning results of the study program must agree to contents, teaching, learning strategies and performance criteria. The teacher should specify methods, teaching techniques and practices developed in the learning strategies; as well as, identify those tasks that must be developed by each student.

Besides that, values and attitudes must be linked to the learning result. The actions must be indicated in the column of teaching and learning strategies.

Performance criteria are taken from the evidence that is defined in the curriculum in terms of criteria for assessment of competencies and the evidence contained in the standard.

The time is the amount of hours that the teacher considers necessary to develop contents depending on the learning strategies.

TECHNICAL PROFESSIONAL PROFILE
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

- Interprets technical information related to the specialty.
- Conveys technical instructions, using standard graphic communication clearly.
- Demonstrates abilities and skills in the tasks of the specialty.
- Leads production process, complying with the instructions of superiors.
- Suggests solutions to problems in the production process.
- Develops and evaluates projects in the field.
- Demonstrates quality in their work.
- Uses computer as a tool in the tasks of the specialty.
- Applies standards of Occupational Health.
- Applies systems for preventive and corrective equipment maintenance, and specific machinery and tools for the specialty.
- Demonstrates professional ethics in carrying out duties that are part of the specialty.
- Organizes workshops according to the specific technical standards of the specialty.
- Protects the environment by removing pollution arising from industrial production processes.
- Uses rational materials, equipment, machinery and tools that are required in the specialty.
- Uses appropriate technology in the field, contributing to competitiveness, quality and development of the industrial sector.

TECHNICAL OCCUPATIONAL PROFILE

Technician of Computer Science in Software Development:

- Identifies the concepts, characteristics, uses and applications of different data structures.
- Recognizes the components of each of the different data structures
- Uses the options of preferences and selections; the tools and functions for the handling of layers, channels and masks of a specific software.
- Uses tools and available functions for text handling, painting, coloring and filters in the specific software.
- Distinguishes the components and operation of the digital camera.
- Applies the principles of digital process when capturing images.
- Distinguishes the norms and technical basis for the elaboration of the corporate identity of a specific entity.
- Applies basic principles related to management and elaboration of computer projects.
- Uses instructions, commands, operators, and other elements that integrate the syntax of programming language.
- Applies selection and repetitive structures in the development of specific applications.
- Applies security and hygiene norms in the performance of the tasks.
- Recognizes the components of the administrative process in the work environment associated to their specialty.
- Elaborates a business plan for a small enterprise computer networks.
- Builds basic budgets related to the installation and configuration of computer networks.
- Relates quality basic principles to daily tasks in the working environment.
- Applies concepts related to customer service in work environment.
- Recognizes contributions of work achievement from the proposed objectives.
- Analyzes the origins, development and historical evolution of computer science in the world and in Costa Rica.
- Interprets the legislative evolution of the field of computer science in Costa Rica.
- Applies strategies, security or auditing techniques in different workplace settings related to computer science.
- Solves computers virus problems.
- Uses available functions of the operating system in the administration of computer hardware and software.
- Applies basic word processor functions in the creation of documents.

- Applies spreadsheet tools in the elaboration of documents.
- Uses Internet-related applications to search for and access information.
- Designs web sites for the publication of information on the Internet.
- Uses mobile tools and services to improve work performance.
- Solves problems using the basic tools of mathematical logic.
- Applies algorithms and flow diagrams, structured as tools for logical resolution of problems.
- Identifies elements that integrate the work environment with programming language.
- Develops simple programs using selection and repetitive structures, operators, and functions in a specific language.
- Applies tools and available functions in programming language for input and output management.
- Uses conceptual and theoretical principles as tools for the solution of specific problems.
- Applies the theory of graphs and diagrams as strategies for the solution of specific problems
- Uses available tools for the definition, declaration and files handling.
- Applies different methods and techniques for programs validation.
- Applies modular principles of programming to objects
- Distinguishes basic elements of object-oriented programming.
- Uses principles and foundations of object-oriented programming as a tool for the solution of specific problems.
- Develops different applications using object-oriented programming principles.
- Applies basic design principles.
- Applies basic principles of color theory in the development of projects.
- Applies different colors in designing projects.
- Applies principles that govern typographic design.
- Uses available tools in different specific software for digital design.
- Recognizes types of images and color adjustments for graphic design with the support of specific software.
- Designs different types of windows with established technical approaches.
- Develops external interfaces that fulfill the technical norms defined by the user.
- Identifies elements that integrate the work environment with programming language.
- Applies tools and available functions in programming language for handling output /input operations.
- Characterizes operating systems starting from their technical characteristics.
- Explains the operating system administration method of the processor, processes and memory.

- Uses functions of the operating system for devices and files administration.
- Distinguishes the administrator characteristics of the network functions and the system used by the operating system.
- Distinguishes characteristics of current most common operating systems.
- Identifies basic elements associated with databases.
- Describes characteristics of different models of databases and normalization process.
- Applies elements related to handling information for databases creation and maintenance.
- Uses functions and available tools for the creation or handling of databases.
- Recognizes the components of the administrative process the computer science work environment.
- Elaborates a business plan for a small enterprise in the computer science field.
- Uses different strategies for the management and development of computer projects.
- Identifies the basic elements related to information.
- Recognizes concepts, characteristics, applications and other elements related to information Systems.
- Distinguishes the stages and phases of information system analysis and design.
- Distinguishes basic elements of WEB programming.
- Recognizes functions and basic tools of programming languages guided to WEB development.
- Develops simple WEB applications, using languages available in the market.
- Distinguishes basic elements of .NET programming.
- Uses functions and basic tools for the development of .NET programs.
- Develops small applications using functions and basic .NET tools.
- Develops skills for effective written communication in a second language.
- Develops the four skills in a second language to express thoughts and to communicate in writing and orally with customers.

PROGRAM OBJECTIVES
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

- Use specialized English basic tools for reading and interpreting technical information.
- Use software application as a tool that allows the student to perform quality work.
- Use basic programming tools structured for the solution of specific problems.
- Apply basic techniques for preventive and corrective maintenance of desktop and portable computers.
- Distinguish basic principles of data communication for designing and implementing computer networks.
- Distinguish concepts and fundamental principles of computers.
- Design and represent computer networks consistent with customer' specifications and according to the environment.
- Apply principles and norms in the design and installation of structured wiring.
- Apply installation concepts, configuration and expansion of a network.
- Use functions and available tools in network operating systems for administration.
- Apply basic principles for building and maintenance of simple databases.
- Apply techniques and basic strategies of security and auditing in computer systems.
- Integrate mobile equipment in computer network.

CURRICULAR STRUCTURE
PROGRAM
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

SUBJECT AREA	X	XI	XII
Information and Communication Technologies	6		
Programación	8		
Computer Maintenance	8		
English for Communication	2	2	2
Programming		18	12
Interfaces Gráficas de Usuario		4	
Data Management			10
TOTAL	**24**	**24**	**24**

NOTE: the lessons of this technical area last 60 minutes.

CURRICULAR FRAMEWORK
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

SUBJECT AREA	UNITS IN EACH LEVEL					
	TENTH	HOURS	**ELEVENTH**	HOURS	**TWELFTH**	HOURS
Information and Communication Technologies 6 hours	Computer Basis Software Application Website Design Specialized Information Systems Connectivity Total	24 H 120H 60 H 18 H 18 H 240 H				
Programación 8 horas	Herramientas Lógicas Algoritmos y Diagramas de Flujo Elementos de Programación Programación Total	48 H 48 H 64 H 160 H 320 H				
Computer Maintenance 8 hours	Occupational Health Computer Architecture Maintenance & Computer Upgrading Total	64 H 80 H 176 H 320 H				

SUBJECT-AREA	UNITS IN EACH LEVEL					
	TENTH	HOURS	**ELEVENTH**	HOURS	**TWELFTH**	HOURS
Programming 18 hours			Programming Data Structures Implementing Data Structures Introduction to Object Oriented Programming Object Oriented Programming Quality Culture Marketing Management of Computer Projects Total	72H 90H 108H 108H 108H 54H 54H 126H 720H	Programming WEB Programming . NET Programming Total	96H 96H 108H 300H
Interfaces Gráficas de Usuario 4 horas			Principio de Diseño Teoría de Color Diseño Tipográfico y Composición Artística Diseño Digital Fotografía Digital Interfaz Gráfica de Usuario Total	12H 20H 32H 32H 24H 40H 160H		
Programming 12 hours					Programming WEB Programming . NET Programming Total	96H 96H 108H 300H

SUBJECT-AREA	UNITS IN EACH LEVEL					
	TENTH	HOURS	**ELEVENTH**	HOURS	**TWELFTH**	HOURS
Data Management 10 hours					Operating Systems Data Bases Business Management Information Systems Total	50H 90H 90H 20H 250H
English For Communication 2 hours	Building Personal Interaction at the Company. Daily Life Activities. Working Conditions and Success at Work. Describing Company Furniture, Equipment and Tools. Talking about Plans, Personal and Educational Goals. Communicating Effectively and Giving Presentations. Generating Economic Success. Total	10 H 10 H 10 H 10 H 10 H 10 H 20 H 80H	Safe Work. Introduction to Business activities. Complaints and Solving Problems. Regulations, Rules and Advice. Following Instructions from Manual and Catalogs. Making Telephone Arrangements. Entertaining. Total	10 H 10 H 12 H 12 H 12 H 12 H 12 H 80 H	Day to Day. Customer Service. Stand for Excellence. Travel. Building an Outstanding Future Career. Total	10 H 10 H 10 H 10 H 10 H 50 H

CURRICULAR MAP
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT
TENTH GRADE

SUBJECT- AREA	STUDY BLOCK	LEARNING RESULTS
Information and Communication Technologies 240 hours	Computer basis 24 hours	• Identify concepts, characteristics and decision elements of information and communication technologies for development (ICT). • Interpret elements associated with national and international legislation (ICT). • Use basic norms for entering texts.
	Software Application 120 hours	• Apply basic norms of work to use computer equipment correctly. • Solving computer viruses problems. • Use available functions in operating systems for computer hardware and software administration. • Use several tools for environment management in a graphic operating system. • Use available tools for resources management. • Apply basic functions of a word processor in the production of documents. • Use tools that show a spreadsheet for documents elaboration. • Determine the characteristics and configuration of the slides presentations. • Generate slides with basic elements. • Manipulate objects inside the slides file and assign special effects to presentations.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Information and Communication Technologies 240 hours	Web Design 60 hours	• Use applications related to the Internet and for searching and accessing information. • Distinguish basic elements related to the design of web pages. • Demonstrate basic norms for web pages design and Internet site construction. • Design web pages for publication of information in Internet.
	Specialized Information Systems 18 hours	• Identify concepts, characteristics and applications of information systems. • Distinguish job environment elements from specialized information systems.
	Connectivity 18 hours	• Identify characteristics and requirements for the operation of mobile devices. • Recognize options for equipment or mobile devices connectivity. • Carry out connection and installation of mobile devices and computer equipment.

SUB - AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Programación 320 horas	Herramientas Lógicas 48 horas	• Resolver problemas utilizando los diferentes sistemas numéricos. • Aplicar la lógica proposicional y la lógica de predicados en la determinación de la validez de una proposición dada. • Resolver problemas utilizando el álgebra de Boole. • Identificar los principios básicos relacionados con las permutaciones y combinaciones. • Solucionar problemas utilizando algoritmos, matrices y álgebra de matrices. • Utilizar las relaciones de recurrencia en el análisis de algoritmos. • Aplicar los conceptos de los mapas de Karnaugh en la resolución de problemas.

SUB - AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Programación 320 horas	Algoritmos y Diagramas de Flujo 48 horas	• Aplicar los algoritmos y diagramas de flujo estructurado como herramientas para resolución lógica de problemas computacionales. • Aplicar la simbología para la construcción de algoritmos y diagramas de flujo. • Utilizar la simbología para la construcción de algoritmos y diagramas de flujo.
	Elementos de Programación 64 horas	• Distinguir los conceptos básicos relacionados con la programación estructurada. • Resolver problemas utilizando los elementos que intervienen en el desarrollo de un programa. • Construir bloques de decisión y condiciones compuestas para casos específicos. • Utilizar procedimientos y funciones como parte de la solución de problemas específicos. • Reconocer los elementos fundamentales para el uso de la sintaxis específica de un lenguaje orientado a la programación estructurada.
	Programación 160 horas	• Confeccionar los algoritmos necesarios para la solución de problemas específicos utilizando las herramientas disponibles. • Desarrollar programas sencillos utilizando estructuras de selección, operadores, estructuras de repetición y funciones. • Diseñar programas en un lenguaje de programación que contengan operaciones de manejo de entrada / salida.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Computer Maintenance 320 hours	Ocupational Health 64 hours	• Describe main concepts and specific aspects of Occupational Health. • Illustrate the importance of security in accident prevention. • Apply basic norms for waste elimination management. • Evaluate the importance of danger area signals and access paths. • Apply security norms in diverse activities to prevent accidents in workplaces. • Distinguish causes and effects of accidents caused by fire; as well as preventive methods in workplaces. • Distinguish types of chemical agents associated with computer science to which the student is exposed in workplaces. • Apply different techniques to prevent work overload effects. • Apply different techniques to prevent electric risks. • Describe regulations of occupational health in the computer science field.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Computer Maintenance 320 hours	Computer Architecture 80 hours	• Describe internal components of the computer. • Describe external devices associated with the computer. • Describe different types of software used by the computer.
	Maintenance & Computer Upgrading 176 hours	• Describe health and security measures for working with the computer equipment and manual tools. • Build boot and recovery disks as part of the maintenance security or equipment upgrading processes. • Recognize basic norms to continue the preliminary revision and the inventory. • Distinguish different adapters used in computers. • Recognize the installation and/or configuration procedure of different internal computer components. • Recognize the installation and configuration procedure of external computer devices. • Recognize the installation and configuration procedure of operating systems and other software in the computer. • Determine general computer network concepts.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 80 Hours	Building Personal Interaction at the Company. 10 hours	**Cognitive Target: 1** Exchanging information about: Personal interaction at the company, ways of interacting, meeting people, ethics, personal skills, cultural aspects	• Understanding simple familiar phrases and short statements. • Asking and responding to questions in clearly defined situations. • Reading personal information forms. • Reading a personal letter. • Writing about occupations and writing the name and address on an envelope.
	Daily Life Activities. 10 hours	**Cognitive Target: 2** Interprets and communicates information about: daily activities at home, school and job. Daily routines	• Making appointments for personal business. • Describing my personal schedules. • Talking about daily routines at home, at school and at work. • Predicting the content of a story from the title. • Writing about daily routine.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 80 Hours	Working Conditions and Success at Work. 10 hours	**Cognitive Target: 3** Interprets and communicates information about: someone ´s job, work tasks, and job positions, responsibilities	• Asking and answering about job positions and responding to job interview questions. • Describing someone´s job. and uncompleted work tasks. • Reading and interpreting a job application. and reading magazine articles. • Writing a paragraph describing a job I would like to have. • Filling out a job application.
	Describing Company Furniture, Equipment and Tools. 10 hours	**Cognitive Target: 4** Interprets and communicates information about: company furniture, equipment and tools	• Asking for and give information on companies and products, furniture. • Communicating messages with little or no difficulty about equipment and tools. • Reading and interpreting companies' descriptions. • Writing lists of equipment and tools from different companies.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 80 Hours	Talking about Plans, Personal and Educational Goals. 10 hours	**Cognitive Target: 5** Exchanging information about: leisure activities, holidays and special occasions. Planning educational and personal goals.	• Talking about holiday celebrations and leisure activities. • Describing the steps to fill out different types of forms for college enrollement • Reading news and articles about people´s plans. • Describing possible weekend activities.
	Communicating Effectively and Giving Presentations. 10 hours	**Cognitive Target: 6** Interprets and communicates information about: daily activities at home, school and job. Daily routines.	• Solving problems by phone and making telephone arrangements. • Describing what makes a good communicator. • Evaluating the effects of stress factors and getting advice on presenting. • Describing the facts that affect the success of a presentation.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 80 Hours	Generating Economic Success 20 hours	**Cognitive Target: 7** Using appropriate language for comparing goods, discussing advertisements, describing products and your preferences.	Discussing about advertisements from different communication media. Comparing goods and services and explaining the reasons why I like a product. Describing product characteristics by contrasting and comparing different goods or services. Expanding reading skills by reading job ads from newspapers or magazines and reading formal letters of complaint. Writing a formal letter of complaint, completing a product comparison chart and writing an advertisement.

CURRICULAR MAP
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT
ELEVENTH GRADE

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Programming 720 hours	Programming 72 hours	• Identify the elements included in the work environment of programming language. • Develop simple programs using selection structures, operators, repetitive structures and functions in a specific language. • Apply the tools and functions in programming language for input / output. management.

SUBJECT-AREA	STUDY BLOCK	LEARNING RESULTS
Programming 720 hours	Data Structures 90 hours	• Identify the concepts, characteristics, uses and applications of different data structures. • Recognize the components of data structures.
	Implementing Data Structures 108 hours	• Use conceptual and theoretical principles for the piles or lines handling as a tool in the solution of specific problems. • Applying the theory of graphs and trees as strategies for the resolution of specific problems. • Use available tools for the definition, declaration and files management. • Apply different methods and techniques for program validation.

SUBJECT-AREA	STUDY BLOCK	LEARNING RESULTS
Programming 720 hours	Introduction to Object Oriented Programming 108 hours	• Identify object oriented programming concepts, characteristics and applications. • Apply modularity principles used for object oriented programming. • Distinguish fundamental elements in object oriented programming.
	Object Oriented Programming 108 hours	• Apply object oriented programming concepts in problem solving. • Use principles and fundamentals of object oriented programming as tools for specific problem solving. • Develop different applications using Object Oriented Programming principles.
	Quality Culture 54 hours	• Relate basic principles of quality with the development of daily tasks of a Computer systems technician. • Applies the concepts associated to customer service in the tasks performance related to a computer systems technician. • Recognize the contribution of team work to achieve the target goals.

SUBJECT-AREA	STUDY BLOCK	LEARNING RESULTS
Programming 720 hours	Marketing 54 hours	• Identify the concepts and fundamentals of marketing in the context of software development. • Distinguish marketing stages as applied to software development. • Apply marketing principles in defining the target population of a software product.
	Management of Computer Projects 126 hours	• Identify basic elements in the management of projects. • Recognize elements that integrate the stages and components of software project management process. • Apply fundamental principles related to management and development of projects. • Apply skills, abilities, and knowledge related to software project management in an internship.

SUB - AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Interfaces Gráficas de Usuario 160 horas	Principios de Diseño 12 horas	• Identificar los conceptos, elementos y procesos fundamentales del diseño. • Aplicar los principios fundamentales que regulan el diseño.
	Teoría del Color 20 horas	• Identificar los conceptos y elementos fundamentales relacionados con la teoría del color. • Aplicar los principios básicos de la teoría del color en el desarrollo de proyectos. • Aplicar los modos del color en proyectos de diseño.
	Diseño Tipográfico y Composición Artística 32 horas	• Identificar los conceptos y elementos fundamentales relacionados con la tipografía. • Aplicar los principios que rigen el diseño tipográfico en la confección de diferentes elementos gráficos. • Identificar los conceptos y técnicas fundamentales de la percepción y distribución espacial

SUB - AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Interfaces Gráficas de Usuario 160 horas	Diseño Digital 32 horas	• Identificar las funciones y herramientas disponibles en un software específico para la elaboración de diseños digitales. • Utilizar las herramientas disponibles en diferentes software específicos para diseño digital. • Reconocer los tipos de imágenes y ajustes de color que se pueden trabajar en el diseño gráfico con el apoyo de un software específico. • Utilizar las opciones de preferencias y selecciones en un software específico. • Utilizar las herramientas y funciones para el manejo de capas, canales y máscaras en un software específico. • Utilizar las herramientas y funciones disponibles para el manejo de texto en un software específico. • Utilizar las herramientas disponibles para pintar y colorear con un software específico. • Utilizar las funciones y herramientas disponibles en un software específico para el uso de filtros.
	Fotografía Digital 24 horas	• Examinar los aspectos fundamentales para la toma de fotografías digitales. • Distinguir los componentes y funcionamiento de la cámara fotográfica digital. • Aplicar las normas de seguridad en el uso y mantenimiento de la cámara fotográfica. • Aplicar los principios del proceso fotográfico digital en la toma de imágenes.

SUB – AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Interfaces Gráficas de Usuario 160 horas	Interfaz Gráfica de Usuario 40 horas	• Identificar los conceptos y elementos básicos de la identidad corporativa. • Distinguir las normas y técnicas básicas para la elaboración de la identidad corporativa de un ente determinado. • Identificar los conceptos, características y elementos que integran las Interfaces Gráficas de Usuario. • Aplicar las normas básicas para el diseño y construcción de Interfaces Gráficas de Usuario. • Diseñar diferentes tipos de ventanas de acuerdo con los criterios técnicos establecidos. • Desarrollar interfaces externas que cumplan con las normas técnicas definidas por el usuario. • Aplicar destrezas, habilidades y conocimientos adquiridos referentes a las interfaces gráficas por medio de una pasantía.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication **80 Hours**	Safe Work 10 hours	**Cognitive Target: 1** Exchanging information about: safe and unsafe driving, accidents and job benefits	• Giving reasons for being late at work, school or meeting. • Identifying different signs and prevention procedures. • Describing consequences of accidents and prevention procedures at work. • Identifying special clothes and equipment used at work. • Scanning for specific information related to safety at work. • Reading stories about accidents at work and prevention measures. • Describing the advantages of working in a company.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication **80 Hours**	Introduction to Business Activities. 10 hours	**Cognitive Target: 2** Interprets and communicates information about: Business Activities.	• Comparing the increasing profitability of department stores in our country. • Discussing conditions for starting new business in public and private sector companies. • Making predictions about products or services of the future. • Reading about the development of industries. • Providing advice for people who are starting a new business by writing a letter.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication **80 Hours**	Regulations, Rules and Advice. 12 hours	**Cognitive Target: 3** Interprets and communicates information about: workplace rules and following them.	• Discussing situations when foreign business people make a "cultural mistake." • Talking to a manager about not following rules by structuring a conversation. • Comparing companies´ regulations and giving advice. • Learning about dress code in my country to put it into practice at school or work. • Writing employee dress-code rules to be applied in a company.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication **80 Hours**	Complaints and Solving Problems 12 hours	**Cognitive Target: 4** Exchanging information about: making complaints, apologizing and solving problems	• Learning how to deal with a complaint by voice mail and automated telephone information. • Apologizing when it is required. • Solving problems at the office. • Dealing with problems, client complains and apologizing. • Comprehending the use of items in a first-aid kit. • Writing about solutions to a problem at work or school.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication **80 Hours**	Following Instructions from Manual and Catalogs. 12 hours	**Cognitive Target: 5** Interprets and communicates information about: technical vocabulary related to manuals and catalogue instructions	• Understanding or using appropriate language for informational purposes. • Comparing equipment used in a job taken from different catalogues. • Identifying different equipment and components in catalogues used in a specific field of study. • Interpreting written instructions from a technical manual in a specific field of study

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 80 Hours	Making Telephone Arrangements 12 hours	**Cognitive Target: 6** Exchanging information about: telephone calls and arrangements.	• Exchanging information in telephone conversations. • Expressing fluently leaving and taking a message. • Making an appointment by telephone. • Comparing the different ways of communication that people use in one culture such as expressions or gestures that people from another culture might not understand. • Writing a paragraph about how culture affects business life.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 80 Hours	Entertaining! 12 hours	**Cognitive Target: 7** Demonstrate ability to work cooperatively with others.	• Entertaining guests and promoting leisure activities. • Listening to information about a TV schedule. • Discussing corporate entertaining. • Reading a journal about a trip or magazine descriptions. • Organizing a conference in another country including a variety of aspects.

CURRICULAR MAP
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT
TWELFTH GRADE

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Programming 300 hours	Programming 96 hours	• Identify elements that integrate the work environment of programming languages. • Use the instructions, commands, operators and other elements integrating the syntax of programming language. • Apply selection, repetition and other available structures in specific applications development. • Apply tools and functions in programming language when handling input / output operations.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Programming 300 hours	WEB Programming 96 hours	• Distinguish main elements of WEB programming. • Recognize functions and basic tools of programming languages for development of WEB applications. • Develop simple WEB applications using languages in the market.
	.NET Programming 108 hours	• Distinguish fundamental elements for .NET programming. • Use functions and basic tools for .NET programs development. • Develop small applications using .NET functions and basic tools.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Data Management 250 hours	Operating Systems 50 hours	• Characterize different operating systems using their technical characteristics. • Explain the administration of the processor, process and memory by operating system. • Use operating system functions for administration of devices and files. • Distinguish characteristics of the administrator of net functions and of the system used by the operating system. • Distinguish the characteristics of current common operating systems.
	Databases 90 hours	• Identify the basic elements associated with databases. • Describe characteristics of different models of databases and the standardization processes. • Apply elements related to the management of information for the construction and maintenance of databases. • Use functions and tools available for creation or database management.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Data Management 250 hours	Business Management 90 hours	• Recognize the components of the administrative process at work associated with computers. • Elaborate a business plan for a small computer enterprise. • Use different strategies for management and development of computer projects.
	Information Systems 20 hours	• Identify the fundamental elements related to information. • Recognize concepts, characteristics, applications and other elements related to Information Systems. • Distinguish the stages and phases that compose the analysis and design of Information Systems.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 50 Hours	Day to Day Work 10 hours	**Cognitive Target: 1** Exchanging information about: day to day work.	• Asking and giving information about work routines. • Describing times and conditions of my job and daily routines. • Expressing likes and dislikes in my daily life. • Reading an advertisement about a new product • Writing a plan to improve safety in my home.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 50 Hours	Customer Service 10 hours	**Cognitive Target: 2** Interprets and communicates information about: customer service	• Understanding specifications about the elements of effective telephone communications. • Applying techniques to improve effectiveness as a listener. • Defining the importance of proper telephone techniques in providing excellent service to customers • Understanding details from texts, passages and others. • Stating the importance of attitude and creativity in providing high quality customer service.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication **50 Hours**	Stand for Excellence 10 hours	**Cognitive Target: 3** Exchanging information about: The ability to work cooperatively with others as a member of a team.	• Listening to a conversation between an employer and an employee and between coworkers. • Expressing encouragement when talking about programs and courses. • Reading and discussing about job skills. • Organizing information regarding options between job benefits and personal qualities

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 50 Hours	Travel 10 hours	**Cognitive Target: 4** Interprets and communicates information about travelling	• Listening to statements about a map in order to get to any specific place. • Explaining leisure and entertainment possibilities to a visitor. • Discussing about weather concerns when travelling. • Reading a map from another country to find out cities and places. • Reading about environmental issues to plan a visit to a foreign country. • Revising a business plan to propose an international company. • Developing writing skills: making, accepting or declining an offer.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication **50 Hours**	Building an Outstanding Future Career 10 hours	**Cognitive Target: 5** Interprets and communicates information about: applying or transferring skills learned in one job situation to another.	• Listening to a discussion between two managers. • Discussing community problems and solutions by interviewing classmates. • Talking about life in a city and contrasting it with life in the country side. • Comparing and contrast the lives and goals of people regarding working conditions. • Developing consciousness about my skills, achievements and rewards. • Organizing ideas to design an improvement plan to change my life.

PROGRAM CONTENT

TWELFTH GRADE

SUBJECT – AREA: PROGRAMMING

SUBJECT – AREA: PROGRAMMING

DESCRIPTION

For the mid-level Technician in Software Development it is highly important to master as many paradigms as possible, in the development of abilities and skills in the use of different programming languages. In this context, programming in different work environments is fundamental to improve performance in the work field. The PROGRAMMING subject area, is developed in 12 hours per week, and is integrated by the following study blocks:

- Programming: Apply the concepts, functions and tools available in a specific programming language. The language will be chosen according to the characteristics of each one of the areas of knowledge to which support will be provided.
- WEB Programming: Develop different types of applications for the WEB using the functions and tools available in a specific programming language.
- .NET Programming: Develop different types of applications for .NET using the functions and tools available in the specific programming language.

GENERAL LEARNING RESULTS

Develop in the student the knowledge, abilities and skills to:

- Implement different applications specific to programming oriented to elements in a specific language.
- Implement different applications specific to programming oriented to WEB elements.
- Implement different applications specific to programming oriented to .NET elements.

DISTRIBUTION OF STUDY BLOCK

PROGRAMMING

Study block	Name	Time in hours	Weeks per study block
I.	Programming	96	8
II.	WEB Programming	96	8
III.	.NET Programming	108	9
	TOTAL	300	25

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Programming
Purpose: Programs development in programming language.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Adequately defines basic concepts related to programming.	Specific
Clearly explains each one of the functions of a compiler.	Specific
Effectively identifies the functions and applications of a compiler.	Specific
Correctly uses the syntax of programming language in program´s development.	Specific
Effectively identifies the operators used in the programming language.	Specific
Accurately describes the use of the different operators and invoking of functions.	Specific
Adequately produces simple programs using the functions.	Specific
Effectively identifies the selection and repetitive structures used.	Specific
Effectively solves specific problems using selection or repetitive structures.	Specific
Accurately produces simple programs using the structures.	Specific
Effectively distinguishes the characteristics and types of flows used.	Specific
Correctly represents the use of formats in input / output handling.	Specific
Effectively uses flags in input / output handling.	Specific
Effectively designs programs containing input / output handling operations.	Specific

Competency Elements

Reference	Title of the element
1 – 1	Programs development in programming language.

Performance criteria:

1. Identifies the elements integrating the work environment of programming language.
2. Uses the instructions, commands, operators and other elements integrating the syntax of programming language.
3. Applies selection, repetition and other available structures in specific applications development.
4. Applies tools and functions in programming language when handling input / output operations.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance Evidence:

1. Explains each one of the functions of a compiler.
2. Describes the use of the different operators and invoking of functions.
3. Solves specific problems using selection or repetitive structures.
4. Distinguishes the characteristics and types of flows used.
5. Represents the use of formats in input / output handling.
6. Uses flags in input / output handling.

Knowledge Evidence:

1. Defines basic concepts related to programming.
2. Identifies the functions and applications of a compiler.
3. Identifies the operators used in the programming language.
4. Identifies the selection and repetitive structures used.

Product Evidence:

1. Uses the syntax of programming language in program´s development.
2. Produces simple programs using the functions.
3. Produces simple programs using the structures.
4. Designs programs containing input / output handling operations.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Twelfth
Study block: Programming	Time: 96 hours
Purpose: Programs development in programming language.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

1. Identify elements integrating the work environment of programming language.	• Functions, uses and applications of a compiler
	• Basic concepts of the language:
	  • Variables
	  • Constants
	  • Types of data
	  • Reserved words
	  • Operators
		Teacher:
		• Describes the applications of a compiler.
		• Shows the functions of a compiler.
		• Applies the syntax of programming language.
		• Exemplifies with programs in programming language.
			• Diligence: effort made to achieve something by our own means or with the help of someone else.	• Identifies the elements integrating the work environment of programming language.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student : • Defines basic concepts related to programming. • Explains each one of the functions of a compiler. • Identifies the functions and applications of a compiler. • Uses the syntax of programming language in program´s development.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

2. Use the instructions, commands, operators and other elements integrating the syntax of programming language.	• Operators:
	  • assignment
	  • incremental
	  • decremental
	  • Logical
	• Functions:
	  • Definition
	  • by value
	  • by reference
		<u>Teacher:</u>
		• Defines the operators used in programming language.
		• Describes the use of different operators and invoking functions.
		• Develops programs in the language.
		<u>Student:</u>
		• Identifies the operators used in the programming language.
		• Describes the use of the different operators and invoking of functions.
		• Produces simple programs using the functions.
			• Diligence: effort made to achieve something by our own means or with the help of someone else.	• Uses the instructions, commands, operators and other elements integrating the syntax of programming language.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

3. Apply selection, repetition and other available structures in specific application´s development.	• Structures of selection:
	  • If
	  • If / else
	  • While
	• Repetitive structures :
	  • For
	  • Do / while
		<u>Teacher:</u>
		• Defines the structures used in programming language.
		• Exemplifies the use of selection and repetitive structures for problem solving.
		• Illustrates the use of selection and repetitive structures in programs.
		<u>Student:</u>
		• Identifies the selection and repetitive structures used.
		• Solves specific problems using selection or repetitive structures.
		• Produces simple programs using the structures.
			• Diligence: effort made to achieve something by our own means or with the help of someone else	• Applies selection, repetition and other available structures in specific application´s development.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

4. Apply tools and functions in programming language when handling input / output operations.	• Flows:
	  • Concept
	  • Characteristics
	  • Types
	• Input / output:
	  • Characteristics
	  • Syntax
	• Printing:
	  • Integer values
	  • Floating-point numbers
	  • Chains
	  • Characters
	  • Field width and precisions
	• Use of flags
	• Format of input:
	  • Applications
	  • Syntax
		<u>Teacher:</u>
		• Defines flows in data's input / output.
		• Illustrates the use of tools input / output. Handling.
		• Exemplifies the procedure to print types of data.
		• Develops programs in input / output handling.
		<u>Student:</u>
		• Distinguishes the characteristics and types of flows used.
		• Represents the use of formats in input / output handling.
		• Uses flags in input / output handling.
		• Designs programs containing input / output handling operations.
			• Diligence: effort made to achieve something by our own means or with the help of someone else	• Applies tools and functions in programming language when handling input / output operations.

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Programming	PRACTICE No. 1

Purpose:

Scenario: Computer Lab	Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures:

Teacher:

- Describes the applications of a compiler.
- Shows the functions of a compiler.
- Applies the syntax of programming language.
- Exemplifies with programs in programming language.
- Defines the operators used in programming language.
- Describes the use of different operators and invoking functions.
- Develops programs in the language.
- Defines the structures used in programming language.
- Exemplifies the use of selection and repetitive structures for problem solving.
- Illustrates the use of selection and repetitive structures in programs.
- Defines flows in data's input / output.
- Illustrates the use of tools input / output. Handling.
- Exemplifies the procedure to print types of data.
- Develops programs in input / output handling.

RECOMMENDED CHECKLIST	Date:

Student's name:	

Instructions:
These criteria will verify student performance by observation. Write an "X" in the column that best describes each student performance.

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Adequately defines basic concepts related to programming.			
Clearly explains each one of the functions of a compiler.			
Effectively identifies the functions and applications of a compiler.			
Correctly uses the syntax of programming language in programs development.			
Effectively identifies the operators used in the programming language.			
Accurately describes the use of the different operators and invoking of functions.			
Adequately produces simple programs using the functions.			
Effectively identifies the selection and repetitive structures used.			
Effectively solves specific problems using selection or repetitive structures.			
Accurately produces simple programs using the structures.			
Effectively distinguishes the characteristics and types of flows used.			
Correctly represents the use of formats in input / output handling.			
Effectively uses flags in input / output handling.			
Effectively designs programs containing input / output handling operations.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify elements integrating the work environment of programming language.	Identifies elements integrating the work environment of programming language.	Defines basic concepts related to programming.	Knowledge	Adequately defines basic concepts related to programming.
		Explains each one of the functions of a compiler.	Performance	Clearly explains each one of the functions of a compiler.
		Identifies the functions and applications of a compiler.	Knowledge	Effectively identifies the functions and applications of a compiler.
		Uses the syntax of programming language in programs development.	Product	Correctly uses the syntax of programming language in programs development.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use the instructions, commands, operators and other elements integrating the syntax of programming language.	Uses the instructions, commands, operators and other elements integrating the syntax of programming language.	Identifies the operators used in the programming language.	Knowledge	Effectively identifies the operators used in the programming language.
		Describes the use of the different operators and invoking of functions.	Performance	Accurately describes the use of the different operators and invoking of functions.
		Produces simple programs using the functions.	Product	Adequately produces simple programs using the functions.
Apply selection, repetition and other available structures in specific applications development.	Applies selection, repetition and other available structures in specific applications development.	Identifies the selection and repetitive structures used.	Knowledge	Effectively identifies the selection and repetitive structures used.
		Solves specific problems using selection or repetitive structures.	Performance	Effectively solves specific problems using selection or repetitive structures.
		Produces simple programs using the structures.	Product	Accurately produces simple programs using the structures.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Apply tools and functions in programming language when handling input / output operations.	Applies tools and functions in programming language when handling input / output operations.	Distinguishes the characteristics and types of flows used.	Performance	Effectively distinguishes the characteristics and types of flows used.
		Represents the use of formats in input / output handling.	Performance	Correctly represents the use of formats in input / output handling.
		Uses flags in input / output handling.	Performance	Effectively uses flags in input / output handling.
		Designs programs containing input / output handling operations.	Product	Effectively designs programs containing input / output handling operations.

TECHNICAL STANDARDS OF THE EDUCATIONAL INSTITUTION

GENERAL DATA

Title: WEB Programming
Purpose: Programming oriented to the WEB.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly identifies the key considerations for WEB design.	Specific
Effectively describes basic principles for WEB design.	Specific
Adequately recognizes the types of sites and pages or WEB pages found in the market.	Specific
Correctly distinguishes WEB applications rules.	Specific
Effectively mentions concepts associated with programming languages oriented to WEB development.	Specific
Adequately identifies the characteristics of programming languages oriented to WEB development.	Specific
Correctly recognizes the similarities and differences with other languages.	Specific
Correctly distinguishes the specific applications of programming languages oriented to WEB development.	Specific
Correctly identifies the elements determined by programming languages oriented to WEB development.	Specific
Effectively uses the syntax for basic elements in some of programming languages oriented to WEB development.	Specific
Adequately applies the norms in the use of control structures in programming languages oriented to WEB development.	Specific
Correctly develops simple applications used in programming languages oriented to WEB development.	Specific

Competency Elements

Reference	Title of the element
1 - 2	Programming oriented to the WEB

Performance criteria:

1. Distinguishes main elements of WEB programming.
2. Recognizes functions and basic tools of programming languages oriented to WEB development.
3. Develops simple WEB applications using languages in the market.

Application Field:

Category	Class
Services	Provision of Technical Education Services.

Performance evidence:

1. Recognizes the types of sites and pages or WEB pages found in the market.
2. Distinguishes WEB applications rules.
3. Uses the syntax for basic elements in some of the programming languages oriented to WEB development.

Knowledge Evidence:

1. Identifies the key considerations for WEB design.
2. Describes basic principles for WEB design.
3. Mentions concepts associated with programming languages oriented to WEB development.
4. Identifies the characteristics of programming languages oriented to WEB development.
5. Identifies the elements determined by programming languages oriented to WEB development.

Product Evidence:

1. Recognizes the similarities and differences with other languages.
2. Distinguishes the specific applications of programming languages oriented to WEB development.
3. Applies the norms in the use of control structures in programming languages oriented to WEB development.
4. Develops simple applications used in programming languages oriented to WEB development.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Twelfth
Study Block: WEB Programming	Time: 96 hours
Purpose: Programming oriented to the WEB.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

1. Distinguish main elements of WEB programming.	• Key considerations for web design:
	  • Design of each one of the elements
	  • Construction of elements oriented to the user
	  • Principles :
	  • Quality
	  • Functionality
	  • Relevance
	• WEB sites:
	  • Concept
	  • Characteristics
	  • Goals of the site
		Teacher:
		• Defines basic concepts associated with WEB design.
		• Indicates intervening elements in WEB site design.
		• Exemplifies the structure and architecture of the most common WEB sites.
		• Presents WEB application rules.
			• Diligence: effort made to achieve something by our own means or with the help of someone else	• Distinguishes main elements of WEB programming.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Types
	  • Static
	  • Dynamic
	  • Interactive
	  • Structure and architecture
	• WEB pages:
	  • Concept
	  • Characteristics
	  • Types
	• Applications for the WEB:
	  • Design and implementation
	  • Publication in the WEB
	  • Principles :
	  • Stability
	  • Reliability
	  • Security
		<u>Student :</u>
		• Identifies the key considerations for WEB design.
		• Describes basic principles for WEB design.
		• Recognizes the types of sites and pages or WEB pages found in the market.
		• Distinguishes WEB applications rules.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Recognize functions and basic tools of programming languages oriented to WEB development	• Programming languages oriented to WEB development: • Concept • Characteristics • Similarities and differences with other programming languages • Particular tools • Specific applications • Security elements	<u>Teacher:</u> • Defines the concepts associated with programming languages oriented to WEB development. • Identifies characteristics of programming languages oriented to WEB development. • Illustrates particular tools of programming languages oriented to WEB development. • Exemplifies specific applications of programming languages oriented to WEB development.	• Diligence: effort made to achieve something by our own means or with the help of someone else	• Recognizes functions and basic tools of programming languages oriented to WEB development

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Mentions concepts associated with programming languages oriented to WEB development. • Identifies the characteristics of programming languages oriented to WEB development. • Recognizes the similarities and differences with other languages. • Distinguishes the specific applications of programming languages oriented to WEB development.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

3. Develop simple WEB applications using languages in the market.	• Work environment:
	  • Characteristics
	  • Tools and functions available
	  • Elements:
	  • Variables
	  • Constants
	  • Operators
	  • Control structures
	  • Decision
	  • Repetitive structures
	  • Functions
	  • Procedures
	  • Data structures:
	  • Lists
	  • Arrays
	  • Files
	  • Other
		<u>Teacher:</u>
		• Identifies elements determined by programming languages oriented to WEB development
		• Describes tools and functions in programming languages oriented to WEB development.
		• Illustrates the syntax of basic elements in programming languages oriented to WEB development.
			• Diligence: effort made to achieve something by our own means or with the help of someone else.	• Develops simple WEB applications using languages in the market.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Tools in handling the GUI:
	  • Text
	  • Images
	  • Tables
	  • Graphics
	• Elements for interaction with the user:
	  • Buttons
	  • Menus
	  • Windows
		<u>Student:</u>
		• Identifies the elements determined by programming languages oriented to WEB development.
		• Uses the syntax for basic elements in some programming languages oriented to WEB development.
		• Applies the norms in the use of control structures in programming languages oriented to WEB development.
		• Develops simple applications used in programming languages oriented to WEB development.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: WEB Programming	PRACTICE No. 1

Purpose:

Scenario: Computer Lab	Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:

- Defines basic concepts associated with WEB design.
- Indicates intervening elements in WEB site design.
- Exemplifies the structure and architecture of the most common WEB sites.
- Presents WEB application rules.
- Defines the concepts associated with programming languages oriented to WEB development.
- Identifies characteristics of programming languages oriented to WEB development.
- Illustrates particular tools of programming languages oriented to WEB development.
- Exemplifies specific applications of programming languages oriented to WEB development.
- Identifies elements determined by programming languages oriented to WEB development
- Describes tools and functions in programming languages oriented to WEB development.
- Illustrates the syntax of basic elements in programming languages oriented to WEB development.

RECOMMENDED CHECKLIST	Date:

Student's name:	

Instructions:
These criteria will verify student performance by observation. Write an "X" in the column that best describes each student performance.

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Correctly identifies the key considerations for WEB design.			
Effectively describes basic principles for WEB design.			
Adequately recognizes the types of sites and pages or WEB pages found in the market.			
Correctly distinguishes WEB applications rules.			
Effectively mentions concepts associated with programming languages oriented to WEB development.			
Adequately identifies the characteristics of programming languages oriented to WEB development.			
Correctly recognizes the similarities and differences with other languages.			
Correctly distinguishes the specific applications of programming languages oriented to WEB development.			
Correctly identifies the elements determined by programming languages oriented to WEB development.			
Effectively uses the syntax for basic elements in some of programming languages oriented to WEB development.			
Adequately applies the norms in the use of control structures in programming languages oriented to WEB development.			
Correctly develops simple applications used in programming languages oriented to WEB development.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Distinguish main elements of WEB programming.	Distinguishes main elements of WEB programming.	Identifies the key considerations for WEB design.	Knowledge	Correctly identifies the key considerations for WEB design.
		Describes basic principles for WEB design.	Knowledge	Effectively describes basic principles for WEB design.
		Recognizes the types of sites and pages or WEB pages found in the market.	Performance	Adequately recognizes the types of sites and pages or WEB pages found in the market.
		Distinguishes WEB applications rules.	Performance	Correctly distinguishes WEB applications rules.
Recognize functions and basic tools of programming languages oriented to WEB development.	Recognizes functions and basic tools of programming languages oriented to WEB development.	Mentions concepts associated with programming languages oriented to WEB development.	Knowledge	Effectively mentions concepts associated with programming languages oriented to WEB development.
		Identifies the characteristics of programming languages oriented to WEB development.	Knowledge	Adequately identifies the characteristics of programming languages oriented to WEB development.
		Recognizes the similarities and differences with other languages.	Product	Correctly recognizes the similarities and differences with other languages.
		Distinguishes the specific applications of programming languages oriented to WEB development.	Product	Correctly distinguishes the specific applications of programming languages oriented to WEB development.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Develop simple WEB applications using languages in the market.	Develops simple WEB applications using languages in the market.	Identifies the elements determined by programming languages oriented to WEB development.	Knowledge	Correctly identifies the elements determined by programming languages oriented to WEB development.
		Uses the syntax for basic elements in some of programming languages oriented to WEB development.	Performance	Effectively uses the syntax for basic elements in some of programming languages oriented to WEB development.
		Applies the norms in the use of control structures in programming languages oriented to WEB development.	Product	Adequately applies the norms in the use of control structures in programming languages oriented to WEB development.
		Develops simple applications used in programming languages oriented to WEB development.	Product	Correctly develops simple applications used in programming languages oriented to WEB development.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: .NET Programming
Purpose: .NET- oriented programming.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Effectively explains the characteristics of .NET as multiplatform.	Specific
Accurately exemplifies the development techniques in common visual environments.	Specific
Correctly presents the fundamental principles .NET applications must fulfill.	Specific
Effectively mentions the concepts associated with programming languages oriented to the development of .NET applications.	Specific
Effectively identifies the characteristics of programming languages oriented to .NET applications development	Specific
Effectively recognizes the similarities and differences with other languages.	Specific
Effectively distinguishes the specific applications of programming languages oriented to .NET applications development.	Specific
Correctly identifies elements determined by programming languages oriented to .NET applications development.	Specific
Correctly uses the syntax for basic elements in programming languages oriented to the .NET applications development.	Specific
Correctly applies norms used by the control structures of programming languages oriented to.NET applications development.	Specific
Clearly develops simple applications used in programming languages oriented to.NET applications development.	Specific
Effectively explains the characteristics of .NET as multiplatform.	Specific

Competency Elements

Reference	Title of the element
1 - 3	.NET- oriented programming.

Performance criteria:

1. Distinguishes fundamental elements for .NET programming.
2. Uses functions and basic tools for .NET programs development.
3. Develops small applications using.NET functions and basic tools.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance Evidence:

1. Exemplifies the development techniques in common visual environments.
2. Presents the fundamental principles .NET applications must fulfill.
3. Recognizes the similarities and differences with other languages.
4. Distinguishes the specific applications of programming languages oriented to .NET applications development.
5. Uses the syntax for basic elements in programming languages oriented to the .NET applications development.
6. Applies norms used by the control structures of programming languages oriented to.NET applications development.

Knowledge Evidence:

1. Explains the characteristics of .NET as multiplatform.
2. Mentions the concepts associated with programming languages oriented to the development of .NET applications.
3. Identifies the characteristics of programming languages oriented to .NET applications development.
4. Identifies elements determined by programming languages oriented to .NET applications development.

Product Evidence:

1. Develops simple applications used in programming languages oriented to.NET applications development.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Twelfth
Study Block: .NET programming.	Time: 108 hours
Purpose: .NET- oriented programming.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Distinguish fundamental elements for .NET programming.	• .NET Platform: • Architecture • Definition of the platform • Layers • Layers of .NET language • .NET Framework • Impact of the .NET on the operating systems • Advantages of the .NET infrastructure • Coexistence of .NET and COM	Teacher: • Defines basic concepts associated with .NET design. • Identifies key considerations for .NET design. • Describes basic principles for .NET design.	• Diligence: effort made to achieve something by our own means or with the help of someone else	• Distinguishes fundamental elements for .NET programming.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• .NET as a multiplatform of development :
	  • Determination of the required platform
	  • .NET platform products
	  • Development of .NET applications using SDK
	• Techniques for development in visual environments:
	  • Development fundamentals
	  • Syntax elements
		<u>Student:</u>
		• Explains the characteristics of .NET as multiplatform.
		• Exemplifies the development techniques in common visual environments.
		• Presents the fundamental principles .NET applications must fulfill.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

2. Use functions and basic tools for .NET programs development.	• Variables, arrays and types of data:
	  • Variables
	  • Data conversion
	  • Access to value type and reference type data
	  • Strong typing skills
	  • Elemental management of the variables
	  • Structures and numbering
	• Namespaces and development of libraries:
	  • Namespaces
	  • Use of namespaces
	  • Creation of own namespaces
	  • Alias for the namespaces
	  • Independence of the assemblies
		<u>Teacher:</u>
		• Defines concepts associated with programming languages oriented to .NET applications development.
		• Identifies the characteristics of programming languages oriented to .NET applications development.
		• Describes the similarities and differences with other languages
		• Illustrates the particular tools of programming languages oriented to.NET applications development.
			• Diligence: effort made to achieve something by our own means or with the help of someone else	• Uses functions and basic tools for .NET programs development.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Management of operators:
	  • Arithmetical
	  • by assignment
	  • Comparative
	  • Logical
	  • Priority between operators
	• Decision and control structures
	• Enclosing and nested structures
	• Structured management of exceptions
	  • Errors and exceptions
	  • Management of exceptions
	  • Try … match
	  • Filtering exceptions
	  • Launching exceptions
		<u>Student:</u>
		• Mentions the concepts associated with programming languages oriented to the development of .NET applications.
		• Identifies the characteristics of programming languages oriented to .NET applications development
		• Recognizes the similarities and differences with other languages.
		• Distinguishes the specific applications of programming languages oriented to .NET applications development.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
3. Develop small applications using .NET functions and basic tools.	• Application development of : • User interface • Development of interfaces based on objects • Hierarchy of classes related to controls • Classification of controls • Approach	<u>Teacher:</u> • Identifies the elements determined by programming languages oriented to .NET applications development. • Describes tools and functions in programming languages oriented to .NET applications development. • Illustrates the syntax in the use of basic elements in programming languages oriented to the development of .NET applications. • Develops simple applications used in programming languages oriented to.NET applications development.	• Diligence: effort made to achieve something by our own means or with the help of someone else	• Develops small applications using.NET functions and basic tools.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies elements determined by programming languages oriented to .NET applications development. • Uses the syntax for basic elements in programming languages oriented to the .NET applications development. • Applies norms used by the control structures of programming languages oriented to.NET applications development. • Develops simple applications used in programming languages oriented to.NET applications development.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: .NET Programming	PRACTICE No. 1

Purpose:

Scenario: Computer Lab	Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:

- Defines basic concepts associated with .NET design.
- Identifies key considerations for .NET design.
- Describes basic principles for .NET design.
- Defines concepts associated with programming languages oriented to .NET applications development.
- Identifies the characteristics of programming languages oriented to .NET applications development.
- Describes the similarities and differences with other languages
- Illustrates the particular tools of programming languages oriented to.NET applications development.
- Identifies the elements determined by programming languages oriented to .NET applications development.
- Describes tools and functions in programming languages oriented to .NET applications development.
- Illustrates the syntax in the use of basic elements in programming languages oriented to the development of .NET applications.
- Develops simple applications used in programming languages oriented to.NET applications development.

RECOMMENDED CHECKLIST	Date:

Name of The Student:	

Instructions:
These criteria will verify student performance by observation. Write an "X" in the column that best describes each student performance.

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Effectively explains the characteristics of .NET as multiplatform.			
Accurately exemplifies the development techniques in common visual environments.			
Correctly presents the fundamental principles .NET applications must fulfill.			
Effectively mentions the concepts associated with programming languages oriented to the development of .NET applications.			
Effectively identifies the characteristics of programming languages oriented to .NET applications development			
Effectively recognizes the similarities and differences with other languages.			
Effectively distinguishes the specific applications of programming languages oriented to .NET applications development.			
Correctly identifies elements determined by programming languages oriented to .NET applications development.			
Correctly uses the syntax for basic elements in programming languages oriented to the .NET applications development.			
Correctly applies norms used by the control structures of programming languages oriented to.NET applications development.			
Clearly develops simple applications used in programming languages oriented to.NET applications development.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Distinguish fundamental elements for .NET programming.	Distinguishes fundamental elements for .NET programming.	Explains the characteristics of .NET as multiplatform.	Knowledge	Effectively explains the characteristics of .NET as multiplatform.
		Exemplifies the development techniques in common visual environments.	Performance	Accurately exemplifies the development techniques in common visual environments.
		Presents the fundamental principles .NET applications must fulfill.	Performance	Correctly presents the fundamental principles .NET applications must fulfill.

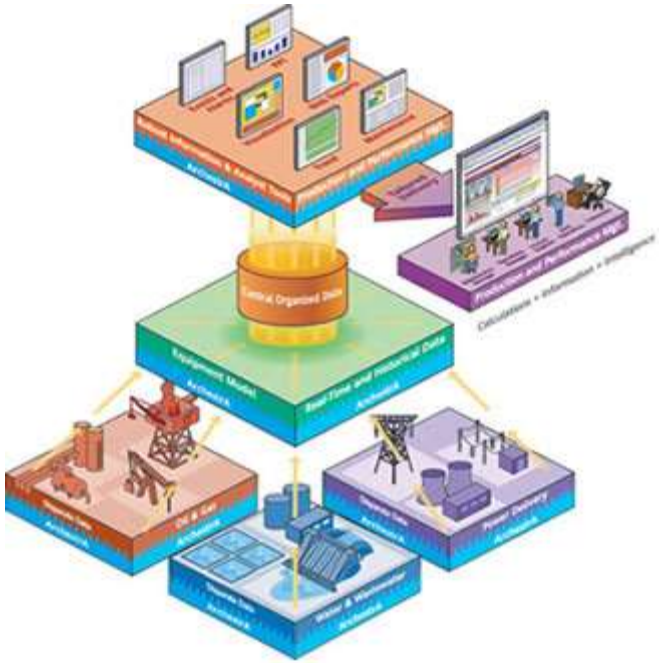
CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use functions and basic tools for .NET programs development.	Uses functions and basic tools for .NET programs development.	Mentions the concepts associated with programming languages oriented to the development of .NET applications.	Knowledge	Effectively mentions the concepts associated with programming languages oriented to the development of .NET applications.
		Identifies the characteristics of programming languages oriented to .NET applications development	knowledge	Effectively identifies the characteristics of programming languages oriented to .NET applications development
		Recognizes the similarities and differences with other languages.	Performance	Effectively recognizes the similarities and differences with other languages.
		Distinguishes the specific applications of programming languages oriented to .NET applications development.	Performance	Effectively distinguishes the specific applications of programming languages oriented to .NET applications development.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Develop small applications using .NET functions and basic tools.	Develops small applications using .NET functions and basic tools.	Identifies elements determined by programming languages oriented to .NET applications development.	knowledge	Correctly identifies elements determined by programming languages oriented to .NET applications development.
		Uses the syntax for basic elements in programming languages oriented to the .NET applications development.	Performance	Correctly uses the syntax for basic elements in programming languages oriented to the .NET applications development.
		Applies norms used by the control structures of programming languages oriented to.NET applications development.	Performance	Correctly applies norms used by the control structures of programming languages oriented to.NET applications development.
		Develops simple applications used in programming languages oriented to.NET applications development.	Product	Clearly develops simple applications used in programming languages oriented to.NET applications development.

SUBJECT AREA: DATA MANAGEMENT



SUBJECT AREA: DATA MANAGEMENT

D E S C R I P T I O N

The sub-area Data Management, is divided into the following study blocks, consisting of 10 hours per week:

- Operating systems: develops basic concepts and work principles of different operating systems currently available.
- Databases: introduces the most important concepts related to database creation and maintenance as well as procedures and handling for data storage.
- Business Management: serves to identify concepts and basic principles related to functioning and operation of the companies related to IT.
- Information Systems: introduces student to main elements of information systems and the stages of the life cycle, as well as the stages of the development process.

GENERAL LEARNING RESULTS

Develop in Student the knowledge, abilities, and skills to:

- Design programs using the tools and structures in programming language
- Select different operating systems with their technical characteristics.
- Implement techniques and procedures for database creation and maintenance.
- Apply norms of effective coexistence in the national productive sector environment.

DISTRIBUTION OF STUDY BLOCK

DATA MANAGEMENT

Study blocks	Name	Time in hours	Weeks per study block
I.	Operating systems	50	5
II.	Databases	90	9
III.	Business Management	90	9
IV.	Information Systems	20	2
	TOTAL	250	25

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Operating Systems
Purpose: Select different operating systems for their technical characteristics.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Properly defines basic concepts related to the operating systems.	Specific
Accurately identifies functions and characteristics of the operating system.	Specific
Clearly describes the operating system calls.	Specific
Correctly uses the functions of the command interpreter.	Specific
Effectively identifies basic concepts related to memory management.	Specific
Properly recognizes the processes carried out by the operating system for the memory assignment.	Specific
Clearly shows different processes developed by the operating system for memory management.	Specific
Accurately identifies basic concepts related to the processor manager.	Specific
Correctly recognizes processes carried out by the operating system for the assignment of the processor.	Specific
Effectively recognizes processes carried out by the operating system for the planning of processes and policy definition.	Specific
Correctly shows different algorithms developed by the operating system for the processor manager.	Specific
Effectively identifies basic concepts related to the management of processes.	Specific
Properly recognizes processes carried out by the operating system.	Specific
Effectively shows typical multiprocessing configurations.	Specific
Properly defines basic concepts related to the operating systems.	Specific
Clearly identifies characteristics and functions of direct access media and storage devices.	Specific
Clearly recognizes different components of the I/O subsystem.	Specific
Correctly explains the communication process between devices.	Specific
Effectively observes the management process of the I/O requests.	Specific

Title	Classification
Effectively describes the file manager's interactions.	Specific
Clearly recognizes different elements of file organization.	Specific
Effectively describes the method for the assignment of physical storage and data compression.	Specific
Clearly uses the access methods of the operating system.	Specific
Properly distinguishes network operating systems by their characteristics.	Specific
Clearly recognizes characteristics and functions of each element in the development of the DOS.	Specific
Effectively recognizes the characteristics and functions of the NOS elements.	Specific
Clearly observes operations performed by the network function manager.	Specific
Clearly identifies stages of the evaluation process of an operating system.	Specific
Properly recognizes the system manager components.	Specific
Clearly explains the functions of the security management system.	Specific
Effectively applies the performance measurement process.	Specific
Effectively lists main historical facts related to each operating system.	Specific
Clearly identifies the main characteristics of each operating system.	Specific
Correctly differentiates between the design´s goals of each operating system.	Specific
Effectively relates management processes of the memory, processor, devices, files, and others in each operating system.	Specific
Correctly compares security mechanisms used by the different operating system.	Specific
Effectively observes the user interface used by each operating system.	Specific

Competency Elements

Reference	Title of the element
2-1	Select different operating systems for their technical characteristics.

Performance criteria:

1. Characterizes different operating systems using their technical characteristics.
2. Explains the administrative method of the processor, the processes and the memory of its operating system.

3. Uses operating system functions for device and file management.
4. Distinguishes characteristics of the network function manager and the system used by the operating system.
5. Distinguishes the characteristics of currently used main operating systems.

Application Field:

Category	Class
Services	Provision of Technical Education Services

Performance Evidence:

1. Describes the operating system calls.
2. Uses the functions of the command interpreter.
3. Recognizes the processes carried out by the operating system for the memory assignment.
4. Recognizes processes carried out by the operating system for the assignment of the processor.
5. Recognizes processes carried out by the operating system for the planning of processes and policy definition.
6. Recognizes processes carried out by the operating system.
7. Recognizes different components of the I/O subsystem.
8. Explains the communication process between devices.
9. Observes the management process of the I/O requests.
10. Recognizes different elements of file organization.
11. Uses the access methods of the operating system.
12. Distinguishes network operating systems and by their characteristics.
13. Recognizes characteristics and functions of each element in the development of the DOS.
14. Recognizes the characteristics and functions of the NOS elements
15. Observes operations performed by the network function manager.
16. Recognizes the system manager components.
17. Explains the functions of the security management system.
18. Lists main historical facts related to each operating system.
19. Compares security mechanisms used by the different operating system.
20. Observes the user interface used by each operating system.

Knowledge Evidence:

1. Defines basic concepts related to the operating systems.
2. Identifies functions and characteristics of the operating system.
3. Identifies basic concepts related to memory management.
4. Identifies basic concepts related to the processor manager.
5. Identifies basic concepts related to the management of processes.
6. Identifies characteristics and functions of direct access media and storage devices.
7. Describes the file manager's interactions.
8. Describes the method for the assignment of physical storage and data compression.
9. Identifies stages of the evaluation process of an operating system.
10. Identifies the main characteristics of each operating system.

Product Evidence:

1. Shows different processes developed by the operating system for memory management.
2. Shows different algorithms developed by the operating system for the processor manager.
3. Shows typical multiprocessing configurations.
4. Applies the performance measurement process.
5. Differentiates between the design´s goals of each operating system.
6. Relates management processes of the memory, processor, devices, files, and others in each operating system.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Data Management	Grade: Twelfth
Study Block: Operating Systems	Time: 50 hours
Purpose: Select different operating systems for their technical characteristics.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Characterize different operating systems using their technical characteristics.	• Operating systems: • Concept • Evolution • Characteristics • Types • Managers • Calls to the system • Structure • Command interpreter	<u>Teacher:</u> • Defines basic concepts for the development of operating systems. • Identifies the functions and characteristics of the operating system. • Describes the managers and the operating system calls. • Illustrates the functions of the command interpreter.	• Respect: each person.	• Characterizes different operating systems using their technical characteristics.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Defines basic concepts related to the operating systems. • Identifies functions and characteristics of the operating system. • Describes the operating system calls. • Uses the functions of the command interpreter.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

2. Explain the administrative method of the processor, the processes, and the memory of its operating system.	• Memory management:
	  • Concepts
	  • Partitions
	  • Assignment of memory in pages
	  • Pagination on demand
	  • Page replacement
	  • Assignment of memory
	  • Virtual memory
		Teacher:
		• Defines concepts related to memory management by the operating system.
		• Describes the processes of memory assignment, pagination and page replacement.
		• Illustrates different processes used by the operating system for memory management.
		Student:
		• Identifies basic concepts related to memory management.
		• Recognizes the processes carried out by the operating system for the memory assignment.
		• Shows different processes developed by the operating system for memory management.
			• Respect: each person.	• Explains the administrative method of the processor, the processes and the memory of its operating system.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Processor manager:
	  • Process planner:
	  • Job status and processes.
	  • Control unit processes
	  • Control unit processes and queues
	  • Planning policies of processes
	  • Algorithms for process planning
		<u>Teacher:</u>
		• Defines concepts related to the processor administration by the operating system.
		• Describes the planning of processes development.
		• Illustrates planning policies of processes defined for management by the operating system
		• Illustrates process planning algorithms used by the operating system.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Process manager:
	  • Mutual unit
	  • Parallel procedure
	  • Typical multiprocessing configurations
	  • Synchronization of processes
	  • Cooperation of processes
	  • Concurrent programming
		<u>Student:</u>
		• Identifies basic concepts related to the processor manager.
		• Recognizes processes carried out by the operating system for the assignment of the processor.
		• Recognizes processes carried out by the operating system for the planning of processes and policy definition.
		• Shows different algorithms developed by the operating system for the processor manager.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Teacher: • Defines concepts related to process management used by the operating system. • Describes the unit processes used by the operating system. • Illustrates typical multiprocessing configurations used for memory management by operating system. • Illustrates software applications for the synchronization of processes.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies basic concepts related to the management of processes. • Recognizes processes carried out by the operating system. • Shows typical multiprocessing configurations. • Observes software applications for the synchronization of processes.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

3. Use operating system functions for device and file management.	• Device manager:
	  • System devices
	  • Direct access storage media
	  • Direct access to storage devices:
	  • Fixed head DASD
	  • Mobile head DASD
	  • Optical storage in disk
	  • Required access time
	  • Components of the I/O subsystem
	  • Communication between devices
		<u>Teacher:</u>
		• Defines basic concepts.
		• Describes characteristics and functions of direct access media and storage devices.
		• Illustrates different components of the I/O subsystem.
		• Illustrates the communication process between devices.
			• Respect: each person.	• Uses operating system functions for device and file management.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Management of I/O requests:
	  • Search device strategies
	  • Latency strategies
		Student:
		• Identifies characteristics and functions of direct access media and storage devices.
		• Recognizes different components of the I/O subsystem.
		• Explains the communication process between devices.
		• Observes the management process of the I/O requests.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• File manager:
	  • Functions
	  • Interaction:
	  • Volume configuration
	  • Subdirectories
	  • File identification rule
	  • Organization of files:
	  • Record format
	  • Physical organization
	  • Physical storage assignment:
	  • Data compression
	  • Access methods:
	  • Sequential
	  • Direct
	  • Levels in a system of file management
		<u>Teacher:</u>
		• Describes the file manager's interactions.
		• Describes different elements of file organization.
		• Illustrates the method for the assignment of physical storage and data compression.
		• Illustrates access methods.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Describes the file manager's interactions. • Recognizes different elements of file organization. • Describes the method for the assignment of physical storage and data compression. • Uses the access methods of the operating system.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

4. Distinguish characteristics of the network function manager and the system used by the operating system.	• Network functions manager :
	  • History
	  • Comparison between network operating systems and distributors
	  • Managers of:
	  • memory
	  • processes
	  • devices
	  • files
	  • network
	  • NOS Development:
	  • Characteristics
	  • Functions
		Teacher:
		• Compares network operating systems as distributors.
		• Describes characteristics and functions of each element in the development of DOS.
		• Describes characteristics and functions of the NOS elements.
		• Illustrates operations performed by the network function manager.
			• Respect: clearness regarding each person.	• Distinguishes characteristics of the network function manager and the system used by the operating system.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Distinguishes network operating systems by their characteristics. • Recognizes characteristics and functions of each element in the development of the DOS. • Recognizes the characteristics and functions of the NOS elements. • Observes operations performed by the network function manager.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	• Systems manager • Evaluation of an operating system • Components • Security: • Levels of protection • Management systems • Assault to the system • Assaults to the network and Internet • Performance measurement: • Tools • Monitoring	<u>Teacher:</u> • Defines basic concepts related to the system manager. • Describes the evaluation process of an operating system. • Illustrates the functions, levels, and security management systems. • Illustrates the performance measurement process.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies stages of the evaluation process of an operating system. • Recognizes the system manager components. • Explains the functions of the security management system. • Applies the performance measurement process.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

5. Distinguish the characteristics of currently used main operating systems.	• MS – DOS:
	  • History
	  • Design goals
	  • Management of:
	  • Memory
	  • Processor
	  • Devices
	  • Files
	  • User interface
		<u>Teacher:</u>
		• Tells the main historical facts related to each operating system.
		• Summarizes the main characteristics of each system.
		• Describes the design goals of each operating system.
		<u>Student:</u>
		• Lists main historical facts related to each operating system.
		• Identifies the main characteristics of each operating system.
		• Differentiates between the designs goals of each operating
			• Respect: clearness regarding each person.	• Distinguishes the characteristics of currently used main operating systems.

		system.		
LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Windows:
	  • History
	  • Design goals
	  • Management of:
	  • the memory
	  • the processor
	  • the devices
	  • the files
	  • the network
	  • the security
	  • User interface
	• UNIX – Linux:
	  • History
	  • Design goals
	  • Management of:
	  • the memory
	  • the processor
	  • the devices
	  • the files
	  • the network
	  • the security
		<u>The Teacher:</u>
		• Exemplifies the management processes for the memory, processor, devices, files and others in each one of the operating systems.
		• Compares the security management Mechanisms between the different operating systems.
		• Explains the characteristics of the user interface in each one of the systems.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Other available systems:
	  • History
	  • Design goals
	  • Management of:
	  • memory
	  • processor
	  • devices
	  • files
	  • network
	  • security
	  • User interface
		Student:
		• Relates management processes of the memory, processor, devices, files, and others in each operating system.
		• Compares security mechanisms used by the different operating system.
		• Observes the user interface used by each operating system.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Operating Systems	PRACTICE No. 1

Purpose:

Scenario: Classroom	Duration:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures
Teacher: • Defines basic concepts for the development of operating systems. • Identifies the functions and characteristics of the operating system. • Describes the managers and the operating system calls. • Illustrates the functions of the command interpreter. • Defines concepts related to memory management by the operating system. • Describes the processes of memory assignment, pagination and page replacement. • Illustrates different processes used by the operating system for memory management. • Defines concepts related to the processor administration by the operating system. • Describes the planning of processes development. • Illustrates planning policies of processes defined for management by the operating system • Illustrates process planning algorithms used by the operating system. • Defines concepts related to process management used by the operating system. • Describes the unit processes used by the operating system. • Illustrates typical multiprocessing configurations used for memory management by operating system. • Illustrates software applications for the synchronization of processes. • Defines basic concepts. • Describes characteristics and functions of direct access media and storage devices. • Illustrates different components of the I/O subsystem. • Illustrates the communication process between devices. • Describes the file manager's interactions. • Describes different elements of file organization. • Illustrates the method for the assignment of physical storage and data compression.

Procedures
Teacher: • Illustrates access methods. • Compares network operating systems as distributors. • Describes characteristics and functions of each element in the development of DOS. • Describes characteristics and functions of the NOS elements. • Illustrates operations performed by the network function manager. • Defines basic concepts related to the system manager. • Describes the evaluation process of an operating system. • Illustrates the functions, levels, and security management systems. • Illustrates the performance measurement process. • Tells the main historical facts related to each operating systems. • Summarizes the main characteristics of each system. • Describes the design goals of each operating systems. • Exemplifies the management processes for the memory, processor, devices, files and others in each one of the operating systems. • Compares the security management • Mechanisms between the different operating systems. • Explains the characteristics of the user interface in each one of the systems.

RECOMMENDED CHECKLIST	Date:

Student's name:	

Instructions:
These criteria will verify student performance by observation. Write an "X" in the column that best describes each student performance.

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Properly defines basic concepts related to the operating systems.			
Accurately identifies functions and characteristics of the operating system.			
Clearly describes the operating system calls.			
Correctly uses the functions of the command interpreter.			
Effectively identifies basic concepts related to memory management.			
Properly recognizes the processes carried out by the operating system for the memory assignment.			
Clearly shows different processes developed by the operating system for memory management.			
Accurately identifies basic concepts related to the processor manager.			
Correctly recognizes processes carried out by the operating system for the assignment of the processor.			
Effectively recognizes processes carried out by the operating system for the planning of processes and policy definition.			
Correctly shows different algorithms developed by the operating system for the processor manager.			
Effectively identifies basic concepts related to the management of processes.			
Properly recognizes processes carried out by the operating system.			
Effectively shows typical multiprocessing configurations.			

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Clearly identifies characteristics and functions of direct access media and storage devices.			
Clearly recognizes different components of the I/O subsystem.			
Correctly explains the communication process between devices.			
Effectively observes the management process of the I/O requests.			
Effectively describes the file manager's interactions.			
Clearly recognizes different elements of file organization.			
Effectively describes the method for the assignment of physical storage and data compression.			
Clearly uses the access methods of the operating system.			
Properly distinguishes network operating systems by their characteristics.			
Clearly recognizes characteristics and functions of each element in the development of the DOS.			
Effectively recognizes the characteristics and functions of the NOS elements.			
Clearly observes operations performed by the network function manager.			
Clearly identifies stages of the evaluation process of an operating system.			
Properly recognizes the system manager components.			
Clearly explains the functions of the security management system.			
Effectively applies the performance measurement process.			
Effectively lists main historical facts related to each operating system.			
Clearly identifies the main characteristics of each operating system.			
Correctly differentiates between the designs goals of each operating system.			
Effectively relates management processes of the memory, processor, devices, files, and others in each operating system.			
Correctly compares security mechanisms used by the different operating system.			
Effectively observes the user interface used by each operating system.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Characterize different operating systems using their technical characteristics.	Characterizes different operating systems using their technical characteristics	Defines basic concepts related to the operating systems.	knowledge	Properly defines basic concepts related to the operating systems.
		Identifies functions and characteristics of the operating system.	knowledge	Accurately identifies functions and characteristics of the operating system.
		Describes the operating system calls.	Performance	Clearly describes the operating system calls.
		Uses the functions of the command interpreter.	Performance	Correctly uses the functions of the command interpreter.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Explain the administrative method of the processor, the processes, and the memory of its operating system.	Explains the administrative method of the processor, the processes, and the memory of its operating system.	Identifies basic concepts related to memory management.	Knowledge	Effectively identifies basic concepts related to memory management.
		Recognizes the processes carried out by the operating system for the memory assignment.	Performance	Properly recognizes the processes carried out by the operating system for the memory assignment.
		Shows different processes developed by the operating system for memory management.	Product	Clearly shows different processes developed by the operating system for memory management.
		Identifies basic concepts related to the processor manager.	knowledge	Accurately identifies basic concepts related to the processor manager.
		Recognizes processes carried out by the operating system for the assignment of the processor.	Performance	Correctly recognizes processes carried out by the operating system for the assignment of the processor.
		Recognizes processes carried out by the operating system for the planning of processes and policy definition.	Performance	Effectively recognizes processes carried out by the operating system for the planning of processes and policy definition.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
		Shows different algorithms developed by the operating system for the processor manager.	Product	Correctly shows different algorithms developed by the operating system for the processor manager.
		Identifies basic concepts related to the management of processes.	Knowledge	Effectively identifies basic concepts related to the management of processes.
		Recognizes processes carried out by the operating system.	Performance	Properly recognizes processes carried out by the operating system.
		Shows typical multiprocessing configurations.	Product	Effectively shows typical multiprocessing configurations.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use operating system functions for device and file management.	Uses operating system functions for device and file management.	Identifies characteristics and functions of direct access media and storage devices.	Knowledge	Clearly identifies characteristics and functions of direct access media and storage devices.
		Recognizes different components of the I/O subsystem.	Performance	Clearly recognizes different components of the I/O subsystem.
		Explains the communication process between devices.	Performance	Correctly explains the communication process between devices.
		Observes the management process of the I/O requests.	Performance	Effectively observes the management process of the I/O requests.
		Describes the file manager's interactions.	Knowledge	Effectively describes the file manager's interactions.

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
		Recognizes different elements of file organization.	Performance	Clearly recognizes different elements of file organization.
		Describes the method for the assignment of physical storage and data compression.	knowledge	Effectively describes the method for the assignment of physical storage and data compression.
		Uses the access methods of the operating system.	Performance	Clearly uses the access methods of the operating system.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Distinguish characteristics of the network function manager and the system used by the operating system.	Distinguishes characteristics of the network function manager and the system used by the operating system.	Distinguishes network operating systems by their characteristics.	Performance	Properly distinguishes network operating systems by their characteristics.
		Recognizes characteristics and functions of each element in the development of the DOS.	Performance	Clearly recognizes characteristics and functions of each element in the development of the DOS.
		Recognizes the characteristics and functions of the NOS elements.	Performance	Effectively recognizes the characteristics and functions of the NOS elements.
		Observes operations performed by the network function manager.	Performance	Clearly observes operations performed by the network function manager.
		Identifies stages of the evaluation process of an operating system.	Knowledge	Clearly identifies stages of the evaluation process of an operating system.

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
		Recognizes the system manager components.	Performance	Properly recognizes the system manager components.
		Explains the functions of the security management system.	Performance	Clearly explains the functions of the security management system.
		Applies the performance measurement process.	Product	Effectively applies the performance measurement process.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Distinguish the characteristics of currently used main operating systems.	Distinguishes the characteristics of currently used main operating systems.	Lists main historical facts related to each operating system.	Performance	Effectively lists main historical facts related to each operating system.
		Identifies the main characteristics of each operating system.	Knowledge	Clearly identifies the main characteristics of each operating system.
		Differentiates between the design´s goals of each operating system.	Product	Correctly differentiates between the design´s goals of each operating system.
		Relates management processes of the memory, processor, devices, files, and others in each operating system.	Product	Effectively relates management processes of the memory, processor, devices, files, and others in each operating system.
		Compares security mechanisms used by the different operating system.	Performance	Correctly compares security mechanisms used by the different operating system.
		Observes the user interface used by each operating system.	Performance	Effectively observes the user interface used by each operating system.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Databases
Purpose: Databases creation and maintenance..
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly defines basic concepts related to data.	Specific
Effectively classifies data according to their attributes.	Specific
Adequately determines the value of different data according to given norms.	Specific
Effectively characterizes different systems in handling data.	Specific
Effectively defines basic concepts related to databases.	Specific
Effectively differentiates relational database characteristics.	Specific
Correctly applies the first three forms of standardization to problems solving.	Specific
Correctly develops databases.	Specific
Correctly distinguishes basic related concepts.	Specific
Effectively identifies basic elements of the environment.	Specific
Effectively interprets the aspects related to security.	Specific
Effectively applies table operations in developed data bases.	Specific
Effectively identifies the concept and characteristics of indexes, relations, control of restrictions and table objects.	Specific
Correctly uses indexes, relations, control of restrictions and table objects.	Specific
Correctly designs diagrams for databases maintenance.	Specific
Correctly creates and gives databases maintenance.	Specific

Competency Elements

Reference	Title of the element
2 - 2	Databases creation and maintenance..

Performance criteria:

1. Identifies the basic elements associated with databases.
2. Describes characteristics of different models of databases and the standardization processes.
3. Applies elements related to the management of information for construction and maintenance of databases.
4. Uses functions and tools available for creation or databases management.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance evidence:

1. Classifies data according to their attributes.
2. Characterizes different systems in handling data.
3. Differentiates relational database characteristics.
4. Interprets the aspects related to security.
5. Uses indexes, relations, control of restrictions and table objects.

Product evidence:

1. Applies the first three forms of standardization to problems solving.
2. Develops databases.
3. Applies table operations in developed data bases.
4. Designs diagrams for databases maintenance.
5. Creates and gives databases maintenance.

Knowledge evidence:

1. Defines basic concepts related to data.
2. Determines the value of different data according to given norms.
3. Defines basic concepts related to databases.
4. Distinguishes basic related concepts.

5. Identifies basic elements of the environment.
6. Identifies the concept and characteristics of indexes, relations, control of restrictions and table objects.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Data Management	Grade: Twelfth
Study Block: Databases	Time: 90 hours
Purpose: Databases creation and maintenance.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Identify the basic elements associated with databases.	• Data: • Concepts: • Data • Records • File • Field • Sources of data • Types of data • Attributes • Value of the data • Systems for data management	<u>Teacher:</u> • Defines basic concepts related to data. • Exemplifies data attributes. • Examines the value of data according to the technical criteria. • Characterizes different systems in handling data.	• Behave in a transparent way with peers.	• Identifies the basic elements associated with databases.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student : • Defines basic concepts related to data. • Classifies data according to their attributes. • Determines the value of different data according to given norms. • Characterizes different systems in handling data.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

2. Describe characteristics of different models of databases and the standardization processes.	• Databases :
	  • Goals of the systems of databases
	• Database manager
	• Model entity – relation:
	  • Interdependence of the data
	  • Architecture of a SABD
	• Relational model:
	  • Relations, domains, attributes and tuples
	  • Functional dependence
	  • Keys:
	  • Primary
	  • Candidate
	  • Alternate
	  • External
		<u>Teacher:</u>
		• Defines basic concepts related to databases.
		• Explains the characteristics of the entity- relation and the relational model.
		• Applies the first three forms of standardization in specific cases.
		• Illustrates with examples databases development.
			• Behave in a transparent way with peers.	• Describes characteristics of different models of databases and the standardization processes.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Normalization:
	  • Applications
	  • The first three forms of normalization
		Student :
		• Defines basic concepts related to databases.
		• Differentiates relational database characteristics.
		• Applies the first three forms of standardization to problems solving.
		• Develops databases.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

3. Apply elements related to the management of information for construction and maintenance of databases.	• Work environment:
	  • Corporate manager
	  • Record, startup and launching of the server
	  • Databases:
	  • Connection
	  • Objects
	  • Output
	• Security:
	  • Security copies
	  • Restoring data bases
	  • Maintenance planning assistant
	  • Security levels
		<u>Teacher:</u>
		• Defines basic concepts related to language.
		• Exemplifies the use of maintenance planning assistant.
		• Describes the creation, management and deletion procedure of databases.
		• Executes table operations.
			• Behave in a transparent way with peers.	• Applies elements related to the management of information for construction and maintenance of databases.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Databases:
	  • Creation, management and deletion
	  • Table :
	  • Creation
	  • Modification
	  • Insertion of rows and columns
	  • Indexes:
	  • Creation, management and deletion
	  • Relations:
	  • Creation and modification
	  • Maintaining relations
	  • Control of restrictions
		<u>Student :</u>
		• Distinguishes basic related concepts.
		• Identifies basic elements of the environment.
		• Interprets the aspects related to security.
		• Applies table operations in developed data bases.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

4. Use functions and tools available for creation or databases management.	• Table objects :
	  • Predetermined properties
	  • Rule
	  • Types of data defined by the user
	• Diagrams:
	  • Creation
	  • Database maintenance
	  • Database change of schedule
	  • Creation of objects
		<u>Teacher:</u>
		• Defines the concepts related to indexes, relations, control of restrictions and table objects.
		• Exemplifies the use of these elements in the creation and maintenance of databases.
		• Uses diagrams for databases maintenance.
		• Creates and gives databases maintenance.
			• Behave in a transparent way with peers.	• Uses functions and tools available for creation or databases management.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student : • Identifies the concept and characteristics of indexes, relations, control of restrictions and table objects. • Uses indexes, relations, control of restrictions and table objects. • Designs diagrams for databases maintenance. • Creates and gives databases maintenance.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Databases	PRACTICE No. 1

Purpose:

Scenario: Computer Lab	Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures
Teacher: • Defines basic concepts related to data. • Exemplifies data attributes. • Examines the value of data according to the technical criteria. • Characterizes different systems in handling data. • Defines basic concepts related to databases. • Explains the characteristics of the entity- relation and the relational model. • Applies the first three forms of standardization in specific cases. • Illustrates with examples databases development. • Defines the concepts related to indexes, relations, control of restrictions and table objects. • Exemplifies the use of these elements in the creation and maintenance of databases. • Uses diagrams for databases maintenance. • Creates and gives databases maintenance.

RECOMMENDED CHECKLIST	Date:

Student's name:	

Instructions:
These criteria will verify student performance by observation. Write an "X" in the column that best describes each student performance.

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Correctly defines basic concepts related to data.			
Effectively classifies data according to their attributes.			
Adequately determines the value of different data according to given norms.			
Effectively characterizes different systems in handling data.			
Effectively defines basic concepts related to databases.			
Effectively differentiates relational database characteristics.			
Correctly applies the first three forms of standardization to problems solving.			
Correctly develops databases.			
Correctly distinguishes basic related concepts.			
Effectively identifies basic elements of the environment.			
Effectively interprets the aspects related to security.			
Effectively applies table operations in developed data bases.			
Effectively identifies the concept and characteristics of indexes, relations, control of restrictions and table objects.			
Correctly uses indexes, relations, control of restrictions and table objects.			
Correctly designs diagrams for databases maintenance.			
Correctly creates and gives databases maintenance.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify the basic elements associated with databases.	Identifies the basic elements associated with databases.	Defines basic concepts related to data.	Knowledge	Correctly defines basic concepts related to data.
		Classifies data according to their attributes.	Performance	Effectively classifies data according to their attributes.
		Determines the value of different data according to given norms.	Knowledge	Adequately determines the value of different data according to given norms.
		Characterizes different systems in handling data.	Performance	Effectively characterizes different systems in handling data.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Describe characteristics of different models of databases and the standardization processes.	Describes characteristics of different models of databases and the standardization processes.	Defines basic concepts related to databases.	Knowledge	Effectively defines basic concepts related to databases.
		Differentiates relational database characteristics.	Performance	Effectively differentiates relational database characteristics.
		Applies the first three forms of standardization to problems solving.	Product	Correctly applies the first three forms of standardization to problems solving.
		Develops databases.	Product	Correctly develops databases.
Apply elements related to the management of information for construction and maintenance of databases.	Applies elements related to the management of information for construction and maintenance of databases.	Distinguishes basic related concepts.	Knowledge	Correctly distinguishes basic related concepts.
		Identifies basic elements of the environment.	Knowledge	Effectively identifies basic elements of the environment.
		Interprets the aspects related to security.	Performance	Effectively interprets the aspects related to security.
		Applies table operations in developed data bases.	Product	Effectively applies table operations in developed data bases.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use functions and tools available for creation or databases management.	Uses functions and tools available for creation or databases management.	Identifies the concept and characteristics of indexes, relations, control of restrictions and table objects.	Knowledge	Effectively identifies the concept and characteristics of indexes, relations, control of restrictions and table objects.
		Uses indexes, relations, control of restrictions and table objects.	Performance	Correctly uses indexes, relations, control of restrictions and table objects.
		Designs diagrams for databases maintenance.	Product	Correctly designs diagrams for databases maintenance.
		Creates and gives databases maintenance.	Product	Correctly creates and gives databases maintenance.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Business Management
Purpose: Effective coexistence in the national productive sector environment.
Competency level: Specific

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Effectively distinguishes the types of companies.	Specific
Correctly explains the contribution of companies to the national economy.	Specific
Adequately relates elements of globalization to our country's ranking in the world's economy.	Specific
Correctly recognizes the qualities of a successful businessperson.	Specific
Efficiently recognizes basic concepts and characteristics of management.	Specific
Effectively distinguishes functional areas of the company.	Specific
Correctly summarizes basic aspects of human resource management.	Specific
Correctly indicates the important aspects for personnel motivation, interest and values development.	Specific
Correctly distinguishes appropriate behavior at the company.	Specific
Adequately recognizes basic aspects contained in the labor code.	Specific
Effectively employs elements of staff supervision in the solving of cases.	Specific
Correctly describes application of ISO at the company in terms of improvement.	Specific
Adequately defines basic concepts related to the process of planning, organization, direction and control.	Specific
Clearly creates an action plan.	Specific
Correctly identifies strengths, opportunities, weaknesses and threats in specific cases.	Specific
Effectively applies the SWOT analysis in the planning of a new company.	Specific
Effectively explains the aspects to be considered for the design and distribution of the physical plant.	Specific
Clearly organizes the storage zones in a company.	Specific

Correctly describes the elements intervening in the work environment, as a function of efficiency.	Specific
Correctly creates a production plan for a company.	Specific
Effectively defines the basic concepts and characteristics of marketing.	Specific
Clearly lists the customer needs according to a company's activity.	Specific
Effectively describes the marketing mix that may be presented with a product or service.	Specific
Clearly creates a marketing plan for a product or service.	Specific
Correctly defines basic concepts related to computer projects.	Specific
Effectively recognizes basic characteristics of computer projects.	Specific
Clearly distinguishes the classical errors that can be incurred during management and development.	Specific
Correctly applies strategies for risk management.	Specific
Adequately distinguishes design aspects and presentation of specific projects in computer field.	Specific
Effectively follows the procedure for the creation of project's documentation.	Specific
Correctly applies basic norms for the creation of a specific project in the computer field.	Specific
Clearly applies the techniques for the creation of specific projects in the computer field.	Specific

Competency Elements

Reference	Title of the element
2 - 3	Effective coexistence in the national productive sector environment.

Performance criteria:

1. Recognizes the components of the administrative process at work associated with computers.
2. Elaborates a business plan for a small computer enterprise
3. Uses different strategies for management and development of computer projects

Application Field:

Category	Classes

Performance Evidence:

1. Explains the contribution of companies to the national economy.
2. Relates elements of globalization to our country ranking in the world's economy.
3. Recognizes the qualities of a successful businessperson.
4. Recognizes basic concepts and characteristics of management
5. Summarizes basic aspects of human resource management.
6. Recognizes basic aspects contained in the labor code.
7. Explains the aspects to be considered for the design and distribution of the physical plant.
8. Lists the customer needs according to a company's activity.
9. Recognizes basic characteristics of computer projects.
10. Follows the procedure for the creation of project's documentation.

Knowledge Evidence:

1. Distinguishes the types of companies.
2. Distinguishes functional areas of the company.
3. Indicates the important aspects for personnel motivation, interest and values development.
4. Distinguishes appropriate behavior at the company.
5. Describes application of ISO at the company in terms of improvement.
6. Defines basic concepts related to the process of planning, organization, direction and control.
7. Identifies strengths, opportunities, weaknesses and threats in specific cases.
8. Describes the elements intervening in the work environment, as a function of efficiency.
9. Defines the basic concepts and characteristics of marketing.
10. Describes the marketing mix that may be presented with a product or service.
11. Defines basic concepts related to computer projects.
12. Distinguishes the classical errors that can be incurred during management and development.
13. Distinguishes design aspects and presentation of specific projects in computer field.

Product evidence:

1. Employs elements of staff supervision in the solving of cases.
2. Creates an action plan.
3. Applies the SWOT analysis in the planning of a new company.
4. Organizes the storage zones in a company.
5. Creates a production plan for a company.
6. Creates a marketing plan for a product or service.
7. Applies strategies for risk management.
8. Applies basic norms for the creation of a specific project in the computer field.
9. Applies the techniques for the creation of specific projects in the computer field.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Data Management	Grade: Twelfth
Study Block: Business Management	Time: 90 hours
Purpose: Effective coexistence in the national productive sector environment.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

1. Recognize the components of the administrative process at work associated with computers.	• Company:
	  • Concept
	  • Types of companies
	• Relationship company - community
	• Costa Rica in the world market:
	  • Exports and imports
	  • Globalization
	  • international commerce
	  • Modern technology
	  • Competence and competitiveness
		<u>Teacher:</u>
		• Defines types of companies.
		• Describes the relationship company – community.
		• Exemplifies the aspects defining the location of Costa Rica in the world market.
		• Discusses the influence of globalization, technology and competitiveness in the Costa Rican reality.
			• Awareness of what we are, of our strengths and weaknesses.	• Recognizes the components of the administrative process at work associated with computers.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Distinguishes the types of companies. • Explains the contribution of companies to the national economy. • Relates elements of globalization to our country's ranking in the world's economy. • Recognizes the qualities of a successful businessperson.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Management:
	  • Concept
	  • Characteristics
	  • Functional areas:
	  • Production
	  • Marketing
	  • Human Resources
	  • Finances
	  • Financial management:
	  • Concept
	  • Procedures
	  • Juridical aspects
	  • Management of the human resource:
	  • Hiring and selection
	  • Motivation
	  • Organizational behavior
	  • Total customer / quality service
		<u>Teacher:</u>
		• Describes the characteristics of management.
		• Exemplifies the processes of personnel selection and hiring.
		• Illustrates different documents used when applying for employment.
		• Debates the relationship between motivation, interests and values with behavior in the workplace.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Recognizes basic concepts and characteristics of management. • Distinguishes functional areas of the company. • Summarizes basic aspects of human resource management. • Indicates the important aspects for personnel motivation, interest and values development.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Aspects of supervision:
	  • Motivation of personnel
	  • Positive feedback
	  • Resolution of conflicts
	  • Acknowledging efficiency
	• Quality systems:
	  • Concept
	  • Importance of doing things right from the start
	  • Customer needs
	  • ISO 9000 norms for the operation of a company
		<u>Teacher:</u>
		• Describes basic elements of the Labor Code .
		• Discusses the elements affecting customer service and total quality.
		• Summarizes the concept and characteristics of the supervision of personnel.
		• Exemplifies the elements participating in the supervision of personnel.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Distinguishes appropriate behavior at the company. • Recognizes basic aspects contained in the Labor Code . • Employs elements of staff supervision in the solving of cases. • Describes application of ISO at the company in terms of improvement.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

2. Elaborate a business plan for a small computer enterprise.	• Planning, organization, direction and control:
	  • Concept, Importance
	  • Applications
	  • Analysis of the company in the community
	  • Creation of an action plan, personal and corporate
	• SWOT analysis :
	  • Concept
	  • Strengths
	  • Opportunities
	  • Weaknesses
	  • Threats
	  • Aspects, internal and external to the company
	  • The SWOT analysis as instrument of planning
		<u>Teacher:</u>
		• Defines basic concepts of planning, organization, direction and control.
		• Identifies the strengths, opportunities, weaknesses and threats.
		• Applies SWOT analysis in different cases.
		• Examines the relationship of internal and external company aspects.
			• Awareness of who we are, our strengths and weaknesses.	• Elaborates a business plan for a small computer enterprise

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Defines basic concepts related to the process of planning, organization, direction and control. • Creates an action plan. • Identifies strengths, opportunities, weaknesses and threats in specific cases. • Applies the SWOT analysis in the planning of a new company.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Production Plan:
	  • Concept
	  • Characteristics
	  • Elements of efficiency
	  • Design and distribution of the physical plant:
	  • Storage zones: raw materials, finished product
	  • Work environment
	  • Ventilation Areas
	  • Illumination
	  • Psychological effect of color
	  • Work space
	  • Electrical distribution
	  • Zones signage
		<u>Teacher:</u>
		• Explains the company's production plan dedicated to activities of the field.
		• Identifies the storage zones of raw materials and finished product.
		• Describes the job environment that should prevail in a company to achieve greater efficiency.
		• Creates a production plan for a company.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Explains the aspects to be considered for the design and distribution of the physical plant. • Organizes the storage zones in a company. • Describes the elements intervening in the work environment, as a function of efficiency. • Creates a production plan for a company.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Marketing:
	  • Concept
	  • Characteristics
	• Characteristics of a market:
	  • Types of customers
	  • Customer's reasons to buy
	  • Segmentation of the market
	  • the competition Offer – Demand
	• Marketing combination:
	  • Product
	  • Price
	  • Place
	  • Promotion
	• Marketing plan:
	  • Design of a new product or service
	  • Creation of the plan
	  • Presentation of the products
	  • Evaluation of the products
		<u>Teacher:</u>
		• Defines the concepts and characteristics of marketing.
		• Identifies customer needs in relation to corporate activity to be performed.
		• Explains the possible market combinations that may be present in a business activity.
		• Creates a marketing plan of a new product or service related to the field.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Defines the basic concepts and characteristics of marketing. • Lists the customer needs according to a company's activity. • Describes the marketing mix that may be presented with a product or service. • Creates a marketing plan for a product or service.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

3. Use different strategies for management and development of computer projects.	• IT projects:
	  • Concept
	  • Characteristics
	  • Classical errors in the programming of development
	  • Risk management.
	• Project life cycle:
	  • Concept
	  • Characteristics
	  • Types of design:
	  • Cascade
	  • Prototyping
	  • Delivery by stages
	  • Evaluative delivery
	  • Selection of the life cycle more quickly for a specific project
		Teacher:
		• Defines basic concepts related to the computer projects.
		• Identifies the classical errors incurred during management and development.
		• Illustrates the strategies for risk management.
		• Identifies the characteristics of the life cycle.
			• Awareness of who we are, our strengths and weaknesses.	• Uses different strategies for management and development of computer projects

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Estimation:
	  • Of the size
	  • Of the effort
	  • Of the planning
	  • Refining
	• Planning:
	  • Objectives
	  • Strategies
	  • Planning too optimistically
	  • Pressure on planning
	• Customer-oriented development
		<u>Student:</u>
		• Defines basic concepts related to computer projects.
		• Recognizes basic characteristics of computer projects.
		• Distinguishes the classical errors that can be incurred during management and development.
		• Applies strategies for risk management.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Quality control:
	  • Motivation
	  • Team work
	  • Negotiation
	• Tools for the increase in productivity
	• Budget:
	  • Components
	  • Strategies for the creation of budgets
	• Computer projects:
	  • Components for their creation
	  • Aspects of design and presentation
	  • Documentation
		<u>Teacher:</u>
		• Explains causes and consequences of planning optimistically.
		• Illustrates the causes and consequences of pressure on planning.
		• Describes the components of a computer project budget.
		• Proposes different budgets according to specific projects.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Distinguishes design aspects and presentation of specific projects in computer field. • Follows the procedure for the creation of project's documentation. • Applies basic norms for the creation of a specific project in the computer field. • Applies the techniques for the creation of specific projects in the computer field.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Business Management	PRACTICE No. 1

Purpose:

Scenario: Classroom	Duration:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:

- Defines types of companies.
- Describes the relationship company – community.
- Exemplifies the aspects defining the location of Costa Rica in the world market.
- Discusses the influence of globalization, technology and competitiveness in the Costa Rican reality.
- Describes the characteristics of management.
- Exemplifies the processes of personnel selection and hiring.
- Illustrates different documents used when applying for employment.
- Debates the relationship between motivation, interests and values with behavior in the workplace.
- Describes basic elements of the Labor Code .
- Discusses the elements affecting customer service and total quality.
- Summarizes the concept and characteristics of the supervision of personnel.
- Exemplifies the elements participating in the supervision of personnel.
- Defines basic concepts of planning, organization, direction and control.
- Identifies the strengths, opportunities, weaknesses and threats.
- Applies SWOT analysis in different cases.
- Examines the relationship of internal and external company aspects.
- Explains the company's production plan dedicated to activities of the specialty.
- Identifies the storage zones of raw materials and finished product.
- Describes the job environment that should prevail in a company to achieve greater efficiency.
- Creates a production plan for a company.
- Defines the concepts and characteristics of marketing.
- Identifies customer needs in relation to corporate activity to be performed.
- Explains the possible market combinations that may be present in a business activity.
- Creates a marketing plan of a new product or service related to the field.

Procedures

Teacher:

- Defines basic concepts related to the computer projects.
- Identifies the classical errors incurred during management and development.
- Illustrates the strategies for risk management.
- Identifies the characteristics of the life cycle.
- Explains causes and consequences of planning optimistically.
- Illustrates the causes and consequences of pressure on planning.
- Describes the components of a computer project budget.
- Proposes different budgets according to specific projects.

RECOMMENDED CHECKLIST	Date:
Student's name:	

Instructions:
These criteria will verify student performance by observation. Write an "X" in the column that best describes each student performance.

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Effectively distinguishes the types of companies.			
Correctly explains the contribution of companies to the national economy.			
Adequately relates elements of globalization to our country's ranking in the world's economy.			
Correctly recognizes the qualities of a successful businessperson.			
Efficiently recognizes basic concepts and characteristics of management.			
Effectively distinguishes functional areas of the company.			
Correctly summarizes basic aspects of human resource management.			
Correctly indicates the important aspects for personnel motivation, interest and values development.			
Correctly distinguishes appropriate behavior at the company.			
Adequately recognizes basic aspects contained in the labor code.			
Effectively employs elements of staff supervision in the solving of cases.			
Correctly describes application of ISO at the company in terms of improvement.			
Adequately defines basic concepts related to the process of planning, organization, direction and control.			
Clearly creates an action plan.			
Correctly identifies strengths, opportunities, weaknesses and threats in specific cases.			
Effectively applies the SWOT analysis in the planning of a new company.			

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Effectively explains the aspects to be considered for the design and distribution of the physical plant.			
Clearly organizes the storage zones in a company.			
Correctly describes the elements intervening in the work environment, as a function of efficiency.			
Correctly creates a production plan for a company.			
Effectively defines the basic concepts and characteristics of marketing.			
Clearly lists the customer needs according to a company's activity.			
Effectively describes the marketing mix that may be presented with a product or service.			
Clearly creates a marketing plan for a product or service.			
Correctly defines basic concepts related to computer projects.			
Effectively recognizes basic characteristics of computer projects.			
Clearly distinguishes the classical errors that can be incurred during management and development.			
Correctly applies strategies for risk management.			
Adequately distinguishes design aspects and presentation of specific projects in computer field.			
Effectively follows the procedure for the creation of project's documentation.			
Correctly applies basic norms for the creation of a specific project in the computer field.			
Clearly applies the techniques for the creation of specific projects in the computer field.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Recognize the components of the management process in the work environment associated to IT.	Recognizes the components of the management process in the work environment associated to IT.	Distinguishes the types of companies.	Knowledge	Effectively distinguishes the types of companies.
		Explains the contribution of companies to the national economy.	Performance	Correctly explains the contribution of companies to the national economy.
		Relates elements of globalization to our country ranking in the world's economy.	Performance	Adequately relates elements of globalization to our country's ranking in the world's economy.
		Recognizes the qualities of a successful businessperson.	Performance	Correctly recognizes the qualities of a successful businessperson.
		Recognizes basic concepts and characteristics of management.	Performance	Efficiently recognizes basic concepts and characteristics of management.
		Distinguishes functional areas of the company.	Knowledge	Effectively distinguishes functional areas of the company.
		Summarizes basic aspects of human resource management.	Performance	Correctly summarizes basic aspects of human resource management.

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
		Indicates the important aspects for personnel motivation, interest and values development.	Knowledge	Correctly indicates the important aspects for personnel motivation, interest and values development.
		Distinguishes appropriate behavior at the company.	Knowledge	Correctly distinguishes appropriate behavior at the company.
		Recognizes basic aspects contained in the labor code.	Performance	Adequately recognizes basic aspects contained in the labor code.
		Employs elements of staff supervision in the solving of cases.	Product	Effectively employs elements of staff supervision in the solving of cases.
		Describes application of ISO at the company in terms of improvement.	Knowledge	Correctly describes application of ISO at the company in terms of improvement.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Create a business plan for a micro business that will perform in the IT area.	Creates a business plan for a micro business that will perform in the IT area.	Defines basic concepts related to the process of planning, organization, direction and control.	Knowledge	Adequately defines basic concepts related to the process of planning, organization, direction and control.
		Creates an action plan.	Product	Clearly creates an action plan.
		Identifies strengths, opportunities, weaknesses and threats in specific cases.	Knowledge	Correctly identifies strengths, opportunities, weaknesses and threats in specific cases.
		Applies the SWOT analysis in the planning of a new company.	Product	Effectively applies the SWOT analysis in the planning of a new company.
		Explains the aspects to be considered for the design and distribution of the physical plant.	Performance	Effectively explains the aspects to be considered for the design and distribution of the physical plant.
		Organizes the storage zones in a company.	Product	Clearly organizes the storage zones in a company.

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
		Describes the elements intervening in the work environment, as a function of efficiency.	Knowledge	Correctly describes the elements intervening in the work environment, as a function of efficiency.
		Creates a production plan for a company.	Product	Correctly creates a production plan for a company.
		Defines the basic concepts and characteristics of marketing.	Knowledge	Effectively defines the basic concepts and characteristics of marketing.
		Lists the customer needs according to a company's activity.	Performance	Clearly lists the customer needs according to a company's activity.
		Describes the marketing mix that may be presented with a product or service.	Knowledge	Effectively describes the marketing mix that may be presented with a product or service.
		Creates a marketing plan for a product or service.	Product	Clearly creates a marketing plan for a product or service.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use different strategies for the management and development of computer projects.	Uses different strategies for the management and development of computer projects.	Defines basic concepts related to computer projects.	Knowledge	Correctly defines basic concepts related to computer projects.
		Recognizes basic characteristics of computer projects.	Performance	Effectively recognizes basic characteristics of computer projects.
		Distinguishes the classical errors that can be incurred during management and development.	Knowledge	Clearly distinguishes the classical errors that can be incurred during management and development.
		Applies strategies for risk management.	Product	Correctly applies strategies for risk management.
		Distinguishes design aspects and presentation of specific projects in computer field.	Knowledge	Adequately distinguishes design aspects and presentation of specific projects in computer field.

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
		Follows the procedure for the creation of project's documentation.	Performance	Effectively follows the procedure for the creation of project's documentation.
		Applies basic norms for the creation of a specific project in the computer field.	Product	Correctly applies basic norms for the creation of a specific project in the computer field.
		Applies the techniques for the creation of specific projects in the computer field.	Product	Clearly applies the techniques for the creation of specific projects in the computer field.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Information Systems
Purpose: Use of different functions and tools available in specialized Information Systems.
Competency level: Specific

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Effectively defines the concept of information.	Specific
Correctly recognizes the characteristics of information in the organization.	Specific
Adequately distinguishes the impact and influence of information in the organizational context.	Specific
Correctly mentions the importance of guaranteeing security information	Specific
Correctly identifies the concepts related to Information Systems.	Specific
Effectively recognizes the characteristics of the elements integrating an information system.	Specific
Efficiently distinguishes the different stages determining the life cycle of an information system.	Specific
Correctly identifies the relevant aspects related to the use of Information Systems within the organizational context.	Specific
Correctly defines the concepts related to the analysis and design of Information Systems.	Specific
Correctly recognizes the characteristics of the stages of analysis and design of Information Systems.	Specific
Adequately distinguishes different stages of analysis and design of Information Systems.	Specific
Effectively interprets basic information contained in tools related to the analysis and design of Information Systems.	Specific

Competency Elements

Reference	Title of the element
2 - 4	Use of different functions and tools available in specialized Information Systems.

Performance criteria:

1. Identifies the main elements related to information.
2. Recognizes the concepts, characteristics, applications and other elements related to Information Systems.
3. Distinguishes the stages and phases composing the analysis and design of Information Systems.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance evidence:

1. Recognizes the characteristics of information in the organization.
2. Distinguishes the impact and influence of information in the organizational context.
3. Mentions the importance of guaranteeing security information.
4. Distinguishes the different stages determining the life cycle of an information system.
5. Recognizes the characteristics of the stages of analysis and design of Information Systems.
6. Distinguishes different stages of analysis and design of Information Systems.

Knowledge evidence:

1. Defines the concept of information.
2. Identifies the concepts related to Information Systems.
3. Recognizes the characteristics of the elements integrating an information system.
4. Identifies the relevant aspects related to the use of Information Systems within the organizational context.
5. Defines the concepts related to the analysis and design of Information Systems.

Product evidence:

1. Interprets basic information contained in tools related to the analysis and design of Information Systems.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Data Management	Grade: Twelfth
Study Block: Information Systems	Time: 20 hours
Purpose: Use of different functions and tools available in specialized Information Systems.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

1. Identify the fundamental elements related to information.	• Information:
	  • Concept
	  • Characteristics
	  • Information versus data
	• Information, organizations and business processes:
	  • Importance of information in the organizations
	  • Information and business strategies
		Teacher:
		• Defines the concept of information.
		• Mentions the characteristics of information.
		• Differentiates the concepts of information and data.
		• Mentions the impact and influence of information on the organizational context.
			• Diligence: effort performed to achieve something by oneself or with the help of someone else	• Identifies the fundamental elements related to information.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	• Use of Information Systems to obtain competitive advantages • The security of the information	<u>Student :</u> • Defines the concept of information. • Recognizes the characteristics of information in the organization. • Distinguishes the impact and influence of information in the organizational context. • Mentions the importance of guaranteeing security information		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

2. Recognize concepts, characteristics, applications and other elements related to Information Systems.	• Information Systems:
	  • Concept
	  • Characteristics
	  • Approaches
	  • Uses and applications in the organization
	  • Analysis and design of systems
	  • Systems' theory
	  • Contributions to organizational decision making
	• Management of the information:
	  • Organization of the data
	  • Environment of the data bases
	  • Requirements in management of the information
		<u>Teacher:</u>
		• Defines concepts related to Information Systems.
		• Mentions the characteristics of the elements integrating an information system.
		• Presents the intervening elements in the process of information management in an organization.
		• Characterizes different stages determining the life cycle of an information system.
			• Diligence: effort performed to achieve something by oneself or with the help of someone else	• Recognizes concepts, characteristics, applications and other elements related to Information Systems.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Life cycle of the Information Systems:
	  • Concept
	  • Characteristics
	  • Stages
		Student:
		• Identifies the concepts related to Information Systems.
		• Recognizes the characteristics of the elements integrating an information system.
		• Distinguishes the different stages determining the life cycle of an information system.
		• Identifies the relevant aspects related to the use of Information Systems within the organizational context.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

3. Distinguish the stages and phases composing the analysis and design of Information Systems.	• Compilation of data :
	  • Concept
	  • Characteristics
	  • Purposes
	  • Techniques for compiling data
	  • Tools
	• Initial Activities:
	  • Preliminary investigation
	  • Feasibility study
	  • Preliminary proposal
	• Determination of requirements:
	  • Concept
	  • Activities
	  • Elements to be considered
	  • Techniques to identify requirements
		<u>Teacher:</u>
		• Defines concepts related to analysis and design of Information Systems.
		• Presents the intervening elements in the process of analysis and design of Information Systems.
		• Characterizes stages of the analysis and design of Information Systems.
		• Describes the relevant aspects related to the analysis and design of Information Systems.
			• Diligence: effort performed to achieve something by oneself or with the help of someone else	• Distinguishes the stages and phases composing the analysis and design of Information Systems.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA

	• Analysis:
	  • Concept
	  • Characteristics
	  • Principles
	  • Types of analysis
	• Analysis of flows of data :
	  • Concept
	  • Principles
	  • Hierarchies
	  • Diagrams of data flow
	• Data dictionary:
	  • Concept
	  • Characteristics
	  • Uses and applications
	  • Table of symbols
	• Prototypes:
	  • Concept
	  • Characteristics
	  • Uses and applications
		<u>Student:</u>
		• Defines the concepts related to the analysis and design of Information Systems.
		• Recognizes the characteristics of the stages of analysis and design of Information Systems.
		• Distinguishes different stages of analysis and design of Information Systems.
		• Interprets basic information contained in tools related to the analysis and design of Information Systems.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Information Systems	PRACTICE No. 1

Purpose:

Scenario: Classroom	Duration:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:

- Defines the concept of information.
- Mentions the characteristics of information.
- Differentiates the concepts of information and data.
- Mentions the impact and influence of information on the organizational context.
- Defines concepts related to Information Systems.
- Mentions the characteristics of the elements integrating an information system.
- Presents the intervening elements in the process of information management in an organization.
- Characterizes different stages determining the life cycle of an information system.
- Defines concepts related to analysis and design of Information Systems.
- Presents the intervening elements in the process of analysis and design of Information Systems.
- Characterizes stages of the analysis and design of Information Systems.
- Describes the relevant aspects related to the analysis and design of Information Systems.

RECOMMENDED CHECKLIST	Date:

Student's name:	
Instructions: These criteria will verify student performance by observation. Write an "X" in the column that best describes each student performance.	

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Effectively defines the concept of information.			
Correctly recognizes the characteristics of information in the organization.			
Adequately distinguishes the impact and influence of information in the organizational context.			
Correctly mentions the importance of guaranteeing security information			
Correctly identifies the concepts related to Information Systems.			
Effectively recognizes the characteristics of the elements integrating an information system.			
Efficiently distinguishes the different stages determining the life cycle of an information system.			
Correctly identifies the relevant aspects related to the use of Information Systems within the organizational context.			
Correctly defines the concepts related to the analysis and design of Information Systems.			
Correctly recognizes the characteristics of the stages of analysis and design of Information Systems.			
Adequately distinguishes different stages of analysis and design of Information Systems.			
Effectively interprets basic information contained in tools related to the analysis and design of Information Systems.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify the fundamental elements related to information.	Identifies the fundamental elements related to information.	Defines the concept of information.	Knowledge	Effectively defines the concept of information.
		Recognizes the characteristics of information in the organization.	Performance	Correctly recognizes the characteristics of information in the organization.
		Distinguishes the impact and influence of information in the organizational context.	Performance	Adequately distinguishes the impact and influence of information in the organizational context.
		Mentions the importance of guaranteeing security information	Performance	Correctly mentions the importance of guaranteeing security information

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Recognize concepts, characteristics, applications and other elements related to Information Systems.	Recognizes concepts, characteristics, applications and other elements related to Information Systems.	Identifies the concepts related to Information Systems.	Knowledge	Correctly identifies the concepts related to Information Systems.
		Recognizes the characteristics of the elements integrating an information system.	Knowledge	Effectively recognizes the characteristics of the elements integrating an information system.
		Distinguishes the different stages determining the life cycle of an information system.	Performance	Efficiently distinguishes the different stages determining the life cycle of an information system.
		Identifies the relevant aspects related to the use of Information Systems within the organizational context.	Knowledge	Correctly identifies the relevant aspects related to the use of Information Systems within the organizational context.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Distinguish the stages and phases composing the analysis and design of Information Systems.	Distinguishes the stages and phases composing the analysis and design of Information Systems.	Defines the concepts related to the analysis and design of Information Systems.	Knowledge	Correctly defines the concepts related to the analysis and design of Information Systems.
		Recognizes the characteristics of the stages of analysis and design of Information Systems.	Performance	Correctly recognizes the characteristics of the stages of analysis and design of Information Systems.
		Distinguishes different stages of analysis and design of Information Systems.	Performance	Adequately distinguishes different stages of analysis and design of Information Systems.
		Interprets basic information contained in tools related to the analysis and design of Information Systems.	Product	Effectively interprets basic information contained in tools related to the analysis and design of Information Systems.

SUBJECT– AREA: ENGLISH FOR COMMUNICATION

TWELFTH LEVEL

English classes have given me confidence in the four skills, no matter what profession I choose!

DISTRIBUTION OF UNITS
ENGLISH FOR COMMUNICATION

Twelfth Level

Units	Name	Time in hours	Weeks per study block
1	Day to day Work	10 hrs	5 weeks
2	Customer service	10 hrs	5 weeks
3	Striving for excellence	10 hrs	5 weeks
4	Travel	10 hrs	5 weeks
5	Building an Outstanding Future Career	10 hrs	5 weeks
	Total	50 hrs	25 weeks

Subject-area: English for Communication	Grade : Twelfth
Unit 1 **:** **Day to Day Work**	Hours per unit: 10 hours
Cognitive target: Exchanging information about: day to day work.	

LINGUISTIC ACHIEVEMENTS	**CONTENT (FUNCTIONS AND LANGUAGE)**	**PROCEDURES**	**VALUES AND ATTITUDES**	**LEARNING OUTCOMES**
LISTENING • Asking and giving information about work routines. • Describing times and conditions of my job and daily routines. **SPEAKING** • Expressing likes and dislikes in my daily life.	**Functions** • Asking questions regarding working routines. • Talking about your daily working schedule. • Describing likes and dislikes. • Examining job skills and qualifications. • Making wise choices.	**The students:** • Talk about which hours your prefer to work based on the business hours around the world. • Role play people saying what they like about their jobs. • Classify a list of items connected with work which are important and not important to you.	• Observe critically. • Exercises leadership	**The students:** • Ask and give information about working routines. • Describe times and conditions of my job. • Express likes and dislikes in my daily life.

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Reading an advertisement about a new product **WRITING** • Writing a plan to improve safety in my home.	**Language** • Prepositions. • Adverbs of frequency. • Phrasal Verbs. • Verbs followed by –ing. • Reported speech • Reported speech with say and tell. • Used to, be used.	**The students:** • Reading an online advertisement. • Read with understanding. • Planning for a safe environment. • Write a short letter describing the working conditions in a company you work. • Convey ideas in writing.	• Guide others. • Planning ahead of time.	**The students:** • Read an advertisement about a new product. • Write a plan to improve safety in your home.

Subject-area: English for Communication	Grade : Twelfth
Unit 2 : **Customer service**	Hours per unit: 10 hours
Cognitive target: Interprets and communicates information about: customer service	

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Understanding specifications about the elements of effective telephone communications. • Applying techniques to improve effectiveness as a listener. **SPEAKING** • Defining the importance of proper telephone techniques in providing excellent service to customers	**Functions** • Identifying elements of effective telephone communication. • Managing to ensure courtesy in business telephone contacts. • Smiling before you pick up the phone. • Leaving a good last impression. • Letting customers know you want to help. • Asking the customer to repeat if the message is not clear.	**The students:** • Listen to oral techniques about courtesy • Comprehend how to determine the customer needs • Role play how to treat every caller as a welcome guest activity • Development of skills to become a good clerk in customer service by attending the telephone.	• Respect for different styles, methods and procedures. • Understand and be understood by others	**The students:** • Understand specifications about the elements of effective telephone communications. • Apply techniques to improve effectiveness as a listener. • Define the importance of proper telephone techniques in providing excellent service to customers

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Understanding details from texts, passages and others . **WRITING** • Stating the importance of attitude and creativity in providing high quality customer service.	**Language** • Define service mentality? • What is a customer? • How many customers do you think you can attend by day? • Which is the most important key in the service mentality? • Callers can hear your smile even when they can't see it • Give every caller the same courteous, friendly, professional treatment. • Take the initiative. • Greet the caller with a pleasant buffer. • Ask don't demand. • Politeness is never out of style. • Don't make or take calls anonymously	**The students:** • Development of skills to become a better clerk in customer service. • Completion of charts by listening to people speaking about the service attitude to provide high quality customer service.	• Learn from experience • Empathy • Enthusiasm • Ownership • Responsibility • Adaptability	**The students:** • Understand details from text, passages and others. • State the importance of attitude and creativity in providing high quality customer service.

Sub-area: English for Communication	Grade :Twelfth
Unit 3 **: Striving for excellence**	Hours per unit: 10 hours
Cognitive target: Exchanging information about: the ability to work cooperatively with others as a member of a team.	

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Listening to a conversation between an employer and an employee and between coworkers. **SPEAKING** • Expressing encouragement when talking about programs and courses	**Functions** • Discussing about adult education. • Describing types of coursework. • Identifying job skills. • Defining feelings. • Stating work communication. • efining job training.	**The students:** • Acquire and evaluate information. • Listen actively conversations among to different people in order to take notes. • Role play a conversation between a parent and a child. • Interpret and communicate informatio.	• Plan for the future. • Take responsibility for learning. • Cooperate with others.	**The students:** • Listen to a conversation between an employer and an employee and between coworkers. • Express encouragement when talking about programs and courses

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Reading and discussing about job skills. **WRITING** • Organizing information regarding options between job benefits and personal qualities	**Language** • Simple present and present continuous. • Correlative conjunctions. • Expressing future time with will, be going to, and the present continuous. • Part time clauses with after, when, as soon as, before, and until. • Simple past and present perfect. • Express similarities with so, too, either and neither. • Reductions with n´ t.	**The students:** • Reading a career school advertisement. • Reading an email from a teacher. • Reading a job evaluation form. • Reading notes from an interview. • Reading a letter requesting a raise. • Write statements about yourself. • Make a list of programs and courses of interest to you. • Write a letter to a professor. • Fill out a work schedule. • List personal qualities on a chart. • Write a persuasive letter.	• Solve problems. • Make decisions.	**The students:** • Read and discuss about job skills. • Organize information regarding options between job benefits and personal qualities.

Subject-area: English for Communication	Grade: Twelfth
Unit 4 **: Travel**	Hours per unit: 10 hours
Cognitive target: Interprets and communicates information about travelling**.**	

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Listening to statements about a map in order to get to any specific place. **SPEAKING** • Explaining leisure and entertainment possibilities to a foreigner. • Discussing about weather concerns when traveling.	**Functions** • Finding out about a city. • Making offers. • Thanking • Making recommendations. • Travelling for business and pleasure. • Copying with difficult travel situations. • Doing flight reservation. • Renting a car. • Giving and asking for directions. • Attending business events.	**The students:** • Listen to a statement about what people are doing in a business travel. • Role play about a visitor that is coming from abroad to your international marketing company and you are going to help organize her/his visit. • Discuss with a partner about entertainment and leisure activities for a visitor in a foreign country. • Pretend you work for a broadcast company and you are giving the weather report.	• Social and cultural background of people from different countries.	**The students:** • Listen to statements about a map in order to get to any specific place. • Explain leisure and entertainment possibilities to a visitor. • Discuss about weather concerns when travelling.

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Reading a map from another country to find out cities and places. • Reading about environmental issues to plan a visit a to a foreign country. **WRITING** • Revising a business plan to propose an international company. • Developing writing skills making, accepting or declining an offer.	**Language** • You ´re interested in…you should… • If you like…. You should… • Types of transportation. • Learning about culture. • Types of restaurants • Talk about weather. • Sightseeing. • Day trips. • Tipping • Prices in dollars and cents. • I´ d like… I´ d prefer. • I´ d like a single room. • I´ d prefer a nonsmoking room. • Questions: How long How do I get to there? How will you be paying? How long will you be staying?	**The students:** • Develop different reading skills interpreting information related to travelling • Write a short note suggesting what someone might enjoy in Costa Rica and offering your help while in a business travel. • Writing about severe weather conditions	• Cultural aspects presented at each country while you are in a business travel.	**The students:** • Read a map from another country to find out cities and places. • Read about environmental issues to take into account to visit a foreign country. • Revise a business plan to propose it to an international company. • Develop writing skills making, accepting or declining an offer.

Sub-area: English for Communication	Level: Twelfth
Unit 5**: Building an Outstanding Future Career**	Hours per unit: 10 hours
Cognitive target: Interprets and communicates information about: applying or transferring skills learned in one job situation to another.	

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Listening to a discussion between two managers. **SPEAKING** • Discussing community problems and solutions by interviewing classmates. • Talking about life in a city and contrasting it with life in the country side.	**Functions** • Identifying career skills. • Attending to a job fair. • Participating a in job interview. • Defining the strengths and weaknesses. • Describing future plans. • Recognizing work standards. • Expressing emotions.	**The students:** • Identify how to interview appropriately. • Use sources of information about job opportunities such as job descriptions, job ads, and online searches and about job market. • Respond appropriately to common personal information questions. • Role play a conversation on how to relax before a job interview.	• Doing field work. • State goals for the immediate future. • Find problems in your community.	**The students:** • Listen to a discussion between two managers. • Discuss community problems and solutions by interviewing classmates. • Talk about life in a city and contrasting it with life in the country side.

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Comparing and contrasting the lives and goals of people regarding working conditions. **WRITING** • Developing consciousness about my skills, achievements and awards. • Organizing ideas to design an improvement plan to change in life.	**Language** • Real conditionals present and future. • Present unreal conditional. • Future continuous. • Infinitives of purpose. • Infinitives that follow adjectives.	**The students:** • Demonstrate the ability to apply or transfer skills learned in one job situation to another. • Read about careers and skills. • Read about how to have a successful interview. • Read a resume from a job seeker. • Read an employer ´s campaign to improve work conditions. • Make notes about your skills, achievements and awards. • Write a resume for themselves. • Write about how employees feel at work based on field work. • Write a paragraph with your goals for next five years.	• Exercise leadership. • Allocate time	**The students:** • Compare and contrast the lives and goals of people regarding working conditions. • Develop consciousness about my skills, achievements and awards. • Organize ideas to design an improvement plan to change in life.

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ANNEXES

ANNEX 1

PORTFOLIO OF EVIDENCE

1. CONCEPT

A portfolio of evidence is the collection of evidence which assesses a student's work in order to show what he/she has achieved in each subject area according to the Technical Job Competency Standards.

It is a file of evidence made by a student who is guided by a teacher. This tool helps to organize the student's evidence complied during the evaluation process and assessment of real jobs to demonstrate his/her competence. The analysis of evidence determines the student's efforts and achievements in a variety of subject areas.

This feature allows the teacher to have a complete collection of tools for verifying evidence of learning compared to specifications in the Technical Competency Standards of each study block. Thus, the teacher is able to judge whether all the information gathered represents the student´s ability.

2. ADVANTAGES

• Allows for a broader and deeper vision of a student's achievements, strengths, and weaknesses
• Promotes student / teacher participation in monitoring and evaluating their own teaching-learning process which prepares the student to make effective decisions
• Provides feedback on the teaching- learning process in order to make constant improvements
• Encourages processes, such as data collection, systematization, evaluation, and decision making

3. USES AND APPLICATIONS

For teachers
• It allows for decision-making according to each student's characteristics
• Helps monitor the student's progress and learning results
• Enables the development of a training process, which constantly develops individual abilities

For students
• Allows for active and responsible participation in the development of their knowledge, skills, and abilities
• Develops the self-evaluation processes, learning results, and performance criteria suggested for each study block

4. STRATEGIES

Elements to consider when building a portfolio of evidence :

Direct Evidence
-Practices
-Checklists, observation sheets, rating scales
-Product

Indirect evidence
-Reports
-Projects

Additional Evidence
-Interviews (oral questions)
-Questionnaires
-Tests
- Simulations

It is important to remember that the portfolio of evidence is a means to gather information which then permits an accurate decision of the teacher. Therefore it is necessary to:

• design a simple low cost construction model for the student
• explain the basic rules for building the portfolio to the students at the beginning of the school year
• provide a written report to parents about the importance of the portfolio in the assessment process
• define rules regarding portfolio use and handling by both students and teachers.

The portfolio of evidence may be different in content and presentation, but should be standardized so that:
• teachers have a clear idea of the required elements in order to be able to give an opinion about the student's competency. It is important to design a complete organizational structure related to the portfolio.
• it allows the student to use it as a personal tool to reflect his/her creativity.

5. PORTFOLIO COMPONENTS

It is recommended that the portfolio of evidence contain at least the following elements:

• FRONT PAGE
• CONTENTS
• GENERAL INFORMATION
-Name of Technical High School
- Name of the program
- Grade

• GENERAL INFORMATION ABOUT THE SUBJECT AREA
- Name of the subject area
- Name of the teacher
- Number of hours

• GENERAL INFORMATION ABOUT THE STUDENT
-Name
-Home address
-Phone numbers (home, cell, others)
-E-mail

- Parents´ names
-Parents´ phones

• ACADEMIC BACKGROUND
-Courses
- Internship
-Company Practices

• DIAGNOSIS
-Tests
- Questionnaires
- Interviews

- EVALUATION
  Description of the evaluation requirements for the subject area to be explained by the teacher at the beginning of the school year

- EVIDENCE
  Knowledge
  -Questionnaires
  - Written tests

  Performance
  - Laboratory practices or workshop
  - Performance tests

  Product
  -Samples of developed tasks
  - Checklist

- EVALUATION TOOLS

- Classwork - only the rubrics or checklists
- Extraclass work - only the rubrics or checklists

- PORTFOLIO TOOLS
  -Checklist sheets or rubrics used by teachers for portfolio assessment.

- OTHER RELEVANT MATERIALS.

6. PORTFOLIO REVIEW EVIDENCE

The teacher should set a timetable to periodically check the portfolio and this schedule should be given to students at the beginning of the course.

Tools must be designed specifically for portfolio assessment in order to perform this task objectively. This information, once implemented, will be given to the student to put into his/her portfolio of evidence.

7. STEPS TO DESIGN ENGLISH SUBJECT AREA OF PORTFOLIO OF EVIDENCE (FOR ENGLISH TEACHERS ONLY)

- Teachers must follow the previous portfolio building guidelines.
- Teachers must remember that English subject area should be included in the same portfolio of evidence (there is not need to have an extra portfolio for English)
- For the English subject area, you must provide an introduction and then four sections properly labeled for each skill: listening, speaking, reading, and writing.
- Teachers and students should include only assessment rubrics which demonstrate the evidence of language learning in each skill, as well as meaningful activity reports, documents, or other projects.
- There should be a brief description of the process and evaluation tools used by the teacher. Generally, three types of evaluation will be present: teacher performed, peer assessment (feedback to improve the quality of work performance) and self-assessment. The first and last types are mandatory, while the second is optional.

- Remember that the teacher should personally and continuously monitor student progress, providing feedback on the teaching-learning process and ongoing evaluation of student performance. Creativity is essential in this process.
- It is important that teachers develop a holistic scale to assess all four sections of the portfolio.

8. WHAT KIND OF DOCUMENTS AND PAPERS ARE INCLUDED IN THE ENGLISH SECTION OF THE PORTFOLIO?

- It should include a checklist for evaluating class work, outside-of-class work, applied tests, the holistic scale.
- Rubrics for listening, speaking, reading, writing as evidence: for example: writing samples, lists of books that have been read by students, recordings and the student's favorite assignments or any work that illustrates the competence acquisition in a particular skill.
- The portfolio is usually associated with written language, but can also include recordings with examples of oral production.
- The portfolio should not be converted into a file containing a student papers, but must include reflections by the students themselves and by the teachers. Any information that effectively supports assessment should be taken into account. The use of portfolios encourages change in classroom practices through improvements in assessment, motivation, and participation of students in their learning.
- Every student product included in the portfolio should be dated with a brief description of purpose of inclusion and other relevant comments.
- For practical reasons, the number of documents (papers, files, archive, diaries, documents, dossier file, letters, records) in the portfolio should be limited to facilitate review and evaluation.

MINISTRY OF PUBLIC EDUCATION
TECHNICAL EDUCATION DEPARTMENT
TECHNICAL HIGH SCHOOL ……

PORFOLIO OF EVIDENCE

STUDENT:

DATE AND PLACE

CONTENTS

PORTFOLIO OF EVIDENCE

TECHNICAL HIGH SCHOOL:	
Program:	
Grade:	
Subject area:	
Study block:	
Number of hours:	

Student´s name and last name:

RESUME

PERSONAL INFORMATION
• Name:
• Birthdate:
• Address:
• Phone number: • E-mail:
• Parents` names:
• Parents' phone and address:

ACADEMIC BACKGROUND
• Elementary School:
• High School:
• Courses: 1. 2.

INTERNSHIPS AND PRACTICE IN COMPANIES
Company:
Address:
Phone number:
Activities:

EVIDENCE

The following sheets are the necessary evidence to demonstrate student's competency.

Each evidence (knowledge, performance, and product) is included in the table of contents.

LEARNING RESULTS COMPARISON SHEET

Study Block:				
Title:				
Purpose:				
Learning Results	Performance Criteria	Evidence	Competent	
			Yes	Not yet
Student`s name:			Signature:	
Teacher`s name: Place and date:			Signature:	

CONCLUSIONS

Observations:

1. After checking the evidence presented by …….(student's name) and the comparison with the learning results, it can be stated:

   For the learning result ……(write the learning result), it is demonstrated that ...

Recommendations:

These recommendations should go in both directions according to the student's assessment:

A. Validation of the scope of learning results according to findings

B. Recommended improvement measures, specifying the student's weaknesses and possible teaching strategies to improve the results: from participating in a specific activity, receiving reinforcement from the teacher, doing more practices to submitting evidence to demonstrate the development of the required knowledge, skills, or ability

ANNEX 2

Communicative Activities

SPEAKING ACTIVITIES

Activity 1

Name: A day in the life.

Topic: Asking about events.

Materials: A piece of paper for each group.

Objectives: To practice asking questions in the past tense.

Process: The class is divided into groups. One member of each group leaves the room. The remaining group members decide on how the person who is outside spent the previous day. They draw up and exact time schedule from 8am to 8pm and describe where the person was, what he did, who he talked to. The people who were outside are called back in. There they try to find out, how the group thinks they spent the previous day. Then he gives the correct responses.

Taken from Cambridge University Press.

Activity 2

Name: Chit Chat

Topic: Personal information

Materials: Design a questionnaire sheet and one information sheet with names of people, age, country, marital status, job, hobbies

Objectives: The objective of the game is practice questions to find all people described in the questionnaire.

Process: The game may be played with any number. If there are more than 16 students in the class, the activity must be practiced in two groups. Copy one role card and one questionnaire for each student in the class. Distribute one role card to each student and allow a little time for them to become familiar with the information, then give each student the questionnaire. Each student must move around the room asking each other questions until they have found all the people described on the questionnaire.

Example:

QUESTIONNAIRE	ROLE CARD
A technician with two children. A grandmother who lives in … A 24 Grade old nurse An electrician who plays the guitar	John Peter Age:26 Lives in London Married Two children:Tim and Andy Job: technician Hobbies: tennis, football

Taken from Oxford University Press

Activity 3

Name: Looking for a job

Topic: Talking about abilities

Language: Use of can to express ability.

Materials: A set of cards for each student in the class.

Objectives: To practice the use of can + abilities.

Vocabulary: Abilities.

Process: The game may be played with any number of students. Copy enough cards for everyone in the class, make sure that for every employee's card there is a corresponding employer's card. Give out one card to everyone in the class. The object of the game is for every employee to find a job, and for every employer to find a suitable person for the job. To do this , employers will have to move around the class, interviewing candidates for the jobs. They should only take candidates who fulfill all the requirements listed on the advertisement. The game is finished when everyone has a job. If you have an add number of students in the class, either one students will be left without a job, or, if you think this is too cruel, you should alter one of the advertisements to read.

Example:

Taken from Oxford University Press.

You can: swim draw and paint speak French play the piano type sing	WANTED: *KINDER GARDEN TEACHER* *Must be able to:* *Swim, sing* *Speak French, play the piano*
You can: Take shorthand type Play the piano drive Speak French and German swim	WANTED: SECRETARY *Must be able to* Type Take shorthand Speak French and German

Activity 4

Name: Job Prestige

Topic: Occupations

Materials: Prepare a list with 15 different occupations, give a list to every student.

Objectives: To practice speaking about occupations.

Process: Outline the task. Give a list of occupation to each student and tell them to rank them according to two criteria. First arrange them in the order in which these jobs are regarded and paid for in our society. Secondlys, make a list according to the importance of the job. Divide the class in pairs, let students compare their lists and priorities, ask them why do they agree or disagree with their classmate list. Write the differences on the board to discuss with the rest of the class.

Taken from Cambridge University Press.

Activity 5

Name: Secret Topic

Topic: Arguing, Expressing one's opinions

Materials: A piece of paper with a topic on it.

Objectives: To discuss and express one's opinions about a specific topic.

Process: Two students agree on a topic they want to talk about without telling the others what it is. Students start discussing their topic without mentioning it. The others listen. Anyone in the rest of the group who thinks he knows what they are talking about, joins in their conversation. When about a third or half of the class have joined in the game is stopped.

Taken from Cambridge University Press.

LISTENNING ACTIVITIES

Activity 1

Name: Debate the Issue

Topic: Discussion

Materials: Select a sequence which features a controversial issue.

Objectives: To promote communicative competence.

Process: Write a motion on the board related to the topic of the video. for example: everyone should have the right to possess a gun for self protection. Tell Students that you are going to play a sequence related to that motion. As they watch the video, they are to decide how they feel about the motion, play the sequence, tell Students that they are now going to participate in a debate, Ask for volunteers to argue 'pro' and 'con'. Select an equal number of students between 2 and 4, to form two debating teams. Appoint one student from each team to act as captain. Captains will give their presentations first and summarize their team's argument at the end. If there is time, play the sequence again.

Taken from Prentice Hall Regents.

Activity 2

Name: Assemble the script/video

Topic: Listening comprehension

Materials: Select a sequence in which the dialogue provides several clues to the action, and the picture frequently suggest what is being said. You will need two rooms and an audiocassette recorder. Before class, record the sound track of the sequence onto an audiocassette.

Objectives: To practice listening, speaking and writing.

Process: Divide Students into two teams and possibly into subgroups. Tell Students that you are going to play a short sequence. Explain that one team will have the soundtrack only. They must imagine the pictures. The other team will have the video without the sound, they must write the dialogue script. If necessary, give a very brief hint about the subject-matter of the sequence, the names of characters, etc. Team 1 takes the audiocassette recorder to the other room, they play the soundtrack and write down what they think the situation is, who the characters are, what happens during the sequence. Stay with team 2, play the complete sequence with the sound turned down, they play it shot by shot without sound, pausing to allow the team to write the dialogue. Bring team 1 back into the classroom. Divide Students into pairs with one member from team1 working with one member from team 2. Each pair takes a piece of paper with a line down the middle. They must now write the script (short description on the left of the line, dialogue on the right).

Taken from Prentice Hall Regents.

Activity 3

Name: Analyzing Commercials/video

Topic: Discussion, Listening, Note-taking

Materials: Select one or more commercials which provide enough relevant information and discussion points for this activity. Duplicate the handout, make one copy for each student.

Objectives: To discuss, to listen and take notes about a tv commercial.

Process: In class: Distribute the handout. Go over it with Students to make sure they understand the kind of information required. Tell Students that you are going to play a TV commercial. Their task is to complete the chart with information from the commercial. Play the commercial, several times if necessary. Students work individually to complete the chart, as they finish, ask Students to compare their answers with those of another student. Play the commercial again. Students confirm or modify their answers.*Taken from Prentice Hall Regents.*

READING ACTIVITIES

Activity 1

Name: Ten things to Do Before Reading

Topic: Practice previewing

Material: Reading passages from students´ books

Objective: To preview a reading to see what students already know in terms of content and vocabulary.

Process: Ask students to brainstorm for answers to the following questions, then write ideas on the board.

1. Look at the title and the heading for each section. What do you think this passage is going to be about?
2. Look at the pictures. What do you think this passage is going to be about?
3. Read the first and last paragraphs and the first sentence of each paragraph. What do you think this passage is going to be about?
4. Read the title. Now quickly scan the passage and circle all the words that have a connection to the title.
5. Scan the passage and cross out all the words you don´t know. After you read the passage again carefully, look up the words in a dictionary.
6. After looking at the title, pictures, and so on, brainstorm the specific words you expect to see in the passage.
7. After looking at the title and pictures, make up some questions you think this passage might answer.

8. What kind of passage is this?(fiction?-nonfiction?-what kind?) Why would somebody read this? For information? Pleasure?
9. Choose words from the passage and write them on the board. Ask students to scan the passage and circle them.
10. Tell a story about the background of the reading passage, or summarize the passage itself. Ask students to take notes or draw a picture of the story as you speak.

HAVE EVERYONE READ THE PASSAGE.

Taken from new Ways in Teaching Reading.

Activity 2

Name: Newspaper Posters

Topic: Encourage students to read different sections of a newspaper.

Material: Articles from newspapers. Large poster boards, scissors, glue and markers.

Objective: Understanding the content of the sections in a newspaper is essential to give students access to more of the English-speaking world around them.

Process: Clip an assortment of articles and other items from newspapers. Be sure to include enough items from all parts of the papers for all the groups to have plenty to choose from.

Provide a list of all categories to be included in the posters. For example: Front page, metro, business, sports, lifestyles, entertainment, classifieds.

Put Students into groups. Each group uses a poster board and creates a poster that represents the various items found in the different sections, choosing from the articles and items you provide. Ask Students to label the categories.

Taken from new Ways in Teaching Reading.

Activity 3

Name: Monitoring Comprehension

Topic: Monitor students comprehension while reading

Material: Article with long, descriptive paragraphs.

Objective: Allow students to reflect on their understanding of the article at different stages, to predict what may come next and to evaluate how well they are reading while they are engaged in doing it.

Process: Using the article you have selected, prepare questions for each paragraph that Students have to answer:

Ask readers to reflect on what may come next, and draw on previous cultural and personal experience.

Include some questions specifically about monitoring, in addition to the questions about comprehension, for example: *When you ran into a difficult word or meaning, what did you do? Did you reread the word? Read ahead hoping to find the answer? Look in a dictionary? Ask someone else?*

Cut the reading passage into paragraph pieces that you can tape in different places around the classroom in random order.

Group Students and send them around the classroom together, with each group starting at a d different location.

Encourage students to work together and answer the questions as a group. They should discuss how they understood the text in order to answer the questions about comprehension and monitoring.

Have each group piece together the reading text in the correct order.

A general discussion at the end may focus on the main ideas, how students felt as they read each paragraph, and what strategies they used to figure out the paragraph order.

After each paragraph, insert a clue, rather than a question, to find the next paragraph. Clues could include pieces from the next or last paragraph.

Taken from new Ways in Teaching Reading.

WRITING ACTIVITIES

Activity 1

Name: Letters to complaint

Topic: Learn to complain in writing

Material: Chalkboard or overhead projector (OHP).

Objective: Sensitizes students to the differences in register between written and spoken forms, focusing on different language functions, for example, apologizing, giving invitations, offering congratulations, and offering condolences.

Process:

1. Ask students if they have ever written a letter of complaint. Elicit from students what kind of things people complain about in writing, for example, faults in new consumer products, poor services, incorrect bills. Write these up on the board.
2. Using some of the examples on the board, establish who Students would write to if they were to write a letter of complaint. For example, about a faulty CD player, they would write to the shop manager.
3. In pairs ask students to simulate

(a) a conversation with a friend about a CD player they have just bought, but which doesn´t work properly.

(b) a phone call between a consumer with a complaint and the official person they are complaining to, for example, someone who has just bought a CD player that doesn´t work properly and the manager of the shop they bought if from.

4. Ask students to write a letter of complaint to the manager of the shop.
5. In pairs ask students to discuss the differences between complaining: orally to a friend, orally to an official person and in writing to an official person.
6. Elicit differences from students and write them on the board in three columns: oral/friend, oral/official, written/official. The differences should include actual examples of language used.
7. Highlight the differences that have emerged among the three columns and focus on forms that would be appropriate for the letter. Then ask students to write another letter of complaint.

Taken from new Ways in Teaching Writing.

Activity 2

Name: Practical Business Writing

Topic: Inform someone or request information

Material: Paper, appropriate addresses and references. Three standard business letters.

Objective: Give students a formula or a template for business letters, you foster confidence and facility with the language in a realistic situation while teaching both the process and the product

Process: 1. Present the following 10 principles to summarize the basics of business letter writing:

- Write concisely, eliminating stock phrases that serve no purpose, and using reasonably short sentences. Avoid jargon in favor of common words and phrases.
- Consider the reader´s background and expected attitude toward the message, tailoring the words to the reader´s situation and level of understanding.
- Write positively, eliminating negative words from the message.
- Strive for clarity, using familiar words and ensuring that grammar, punctuation, and spelling are correct.
- Check that the information in the message is accurate.
- Look for omissions and inconsistencies to ensure completeness.
- Strive for concreteness with specific amounts and figures, rather than abstract concepts.
- Use active, rather than passive, constructions to foster clarity as well as brevity.
- Ensure fairness-avoid evidence of stereoentering and prejudice.
- Finally, practice ethicality, ensuring that no impossible promises are made, no matter how much goodwill they might create.

2. Present a business letter format and guidelines for one of these three basic business letters: Inquiry letter, Order letter, Request for Assistance

3. Ask students to write a letter.

4. Have students evaluate their own or a peer´s paper using the guidelines for the type of letter and also the 10 principles.

Activity 3

Name: Authentic Texts for Writing

Topic: Organize an effective memorandum

Material: Sample office memoranda. An editing checklist

Objective: Produce writing that reflects the conventions of professional communication.

Process: 1. Collect examples of effective office memoranda of the type you want your students to practice writing themselves (About six examples are sufficient). Collect poorly written or weakly organized ones as well for text-revising practice. In addition, find an example of a checklist for writing effective memorandum that you feel will be useful to your students (see Appendix)

2. Distribute copies of the memorandum to pairs or groups of students.

3. Ask students to examine and compare the memoranda and to answer questions such as the following:

- Where can you find information about the sender and receiver of the message?
- What function does the subject heading serve?
- How many paragraphs are there in the example? Are the paragraphs long and short?
- Reading only the first paragraph, can you tell the main subject of concern in each example?
- Do the sentences vary in the length and type?
- Do the writers use different tenses in their writing?
- Can you spot any grammatical or spelling errors?
- Compare the examples, how do the writers end the memo?

4. As Students work through the memoranda and the questions, ask them to develop the checklist that they think captures the essence of an effective memorandum. The CHECKLIST should consider issues of content, grammar, clarity, conciseness and style.

5. Allow students up to 45 minutes for this activity and then have groups present their information.
6. Now distribute copies of you own editing checklist or writing guide.
7. Review the checklist and compare what each element includes with the information students have produced.
8. Summarize the main points of writing an effective memorandum and prepare students for the writing task.
9. Distribute copies of poorly written memorandum for the groups to analyze, using the checklist to guide them.
10. Each group should suggest how the memorandum can be improved.
11. After discussion, students should rewrite the weak examples on group or individual basis.

SAMPLE EDITING CHECKLIST

Content

- Use informative and specific headings
- Paragraph by idea.
- Retain first choice words.
- Eliminate unnecessary details.
- Proportion should match emphasis.
- Check accuracy and completeness of factual information.

Grammar

- Do not write fragments for sentences.
- Avoid run-on or fused sentences.
- Do not dangle verbal.
- Use parallel structure.
- Make pronouns agree with their antecedents.
- Make verbs agree with their subjects.
- Do not change tenses or words unnecessarily.

- Punctuate correctly.
- Choose appropriate words and phrases.
- Spell correctly.

Style

- Vary sentences patterns and length.
- Substitute stronger verbs for weak ones.
- Prefer a personal, conversational tone.
- Adjust the tone and formality to suit the purpose and audience.
- Clarity
- Prefer short sentences and simple words.
- Use concrete words and phrases over vague general ones.
- Sequence ideas to indicate emphasis.
- Link properly to show relationship.
- Show clear transitions between ideas.
- Use clear references.
- Place modifiers correctly.
- Conciseness
- Prefer active-voice verbs and action verbs.
- Be emphatic and to the point.
- Highlight the main verbs of sentences.
- Cut clichés, redundancies and little-word padding.
- Eliminate needless repetition.

Taken from new Ways in Teaching Writing.

ANNEX 3

LISTENING TASKS

1. Outstanding researchers have referred to the development of this skill as the most important when babies start learning their native language. Non native speakers of any language, need to follow the same process when learning that language.

(Source: D. Nunan 1998 ***Second Language Teaching and Learning*** . Boston: Heinle & Heinle.)

WHY SPEAKING DELAY?

- Some people believe that learning a language is building a *map of meaning in the mind*. However, talking is not the best way to build up this cognitive map in the mind. To do this, the best method is to practice meaningful listening.

- *The listening-only period* is a time of observation and learning which provides the basis for the other language skills. It builds up the necessary knowledge for using the language.

- When this knowledge is clear and complete, the *learner can begin to speak*.

FIVE CONDITIONS FOR LANGUAGE LEARNING TO OCCUR:

- **The Message:**

The learners' attention is focused on the message (function), not on grammatical rules because language acquisition is considered to be an unconscious process. The form of the message requires:
1. The application of conscious language rules,
2. Lots of time to analyze the process of the rules and exceptions, consciously or by heart.

- **Understanding:**

The learner must infer the meaning of most of the message through techniques of simplification of grammar and vocabulary and by using organizational and contextual aids to understanding.

- **Quantity:**

It is necessary a great deal of listening activity before learners feel ready to speak.

- **Interest:**

The learners would like to listen to a relevant message related to their interests.

- **Low Anxiety:**

Listening is a receptive skill. The learners see the learning experiences very easy and relaxed. There is no reason for fears to arise.

Adapted from Nord, J. R. *Developing Listening Fluency before Speaking, 1980: p.17*

ANNEX 4
MULTIPLE INTELLIGENCES THEORY

Verbal/linguistic	Logical/ mathematical	Visual spatial	Bodily/ kinesthetic	Musical/ rhythmic	Interpersonal	Intrapersonal
• Reading • Vocabulary • Formal Speech • Journal/Diary Keeping • Creative Writing • Poetry • Verbal Debate • Impromptu Speaking • Humor/Jokes • Storytelling	• Abstract Symbols/ Formulas • Outlining • Graphic Organizers • Number Sequences • Calculation • Deciphering Codes • Forcing Relationships • Syllogisms • Problem Solving • Pattern	• Guided Imagery • Active Imagination • Color Schemes • Patterns/ Designs • Painting • Drawing • Mind-Mapping • Pretending • Sculpture • Pictures	• Folk/Creative Dance • Role Playing • Physical Gestures • Drama • Martial Arts • Body Language • Physical Exercise • Mime • Inventing • Sports Games	• Rhythmic Patterns • Vocal Sounds/Tones • Music Composition/ Creation • Percussion Vibrations • Humming • Environmental Sounds • Instrumental Sounds • Singing • Tonal Patterns • Music Performance	• Giving Feedback • Intuiting Others' Feelings • Cooperative Learning Strategies • Person-to-Person Communication • Empathy Practices • Division of Labor • Collaboration Skills • Receiving Feedback • Sensing Others' Motives • Group Projects	• Silent Reflection Methods • Met cognition Techniques • Thinking Strategies • Emotional Processing • "Know Thyself" Procedures • Mindfulness Practices • Focusing/ Concentration Skills • Higher-Order Reasoning • Complex Guided Imagery • "Centering" Practices

GLOSSARY

Some terms have been used in this Syllabus, which may be unfamiliar to you. Simple definitions are included for this purpose.

Activity	Situation in which a lot of things are being done, usually in order to achieve a particular purpose.
Assessment	The learner's ability to reflect on the results of his/her learning process.
Attitudes	Expressions of positive or negative feelings towards the learning of a foreign language.
Awareness	Acquaintance, consciousness with knowledge.
Communication	Activity or process of giving information to other people or other living thing, using signals such as speech, body movements or radio signals.
Communicative Competence	The ability not only to apply the grammatical rules of a language in order to form grammatically correct sentences, but also to know when and where to use these sentences and to whom. It includes knowledge of the grammar and vocabulary of the language. Knowledge of rules of speaking, (knowing how to begin and end conversations, what topics may be talked about in different times of speech events, knowing which address forms should be used with different persons.) Knowing how to use language appropriately.
Curriculum	Knowledge, skills, materials, learning activities and terminal behavior required in teaching of any subject.

Cultural Component	The part of the language which includes the total set of beliefs, attitudes, customs, behavior, social habits, etc. Of the members of a particular society.
Evaluation	The whole process of determining the effectiveness of teaching and learning.
Feedback	Monitoring and adapting one's actions on the basis of the perceived effect on the environment. In Language activities, it is a response to the reactions of listeners and readers.
Formal Component	The part of the language which includes the linguistic patterns (structures).
Formative Evaluation	A learning activity through which Students learn from their own mistakes.
Function	A Communicative purpose of a piece of language.
Functional Component	A part of the language which refers to it as an instrument of social interaction rather than a system that is viewed in isolation. Language is often expressive and social. Language is often described as having three main functions: descriptive, expressive and social.
Global Development	The insertion of individual and national working forces into the world development.
Group work	Work in which the class is broken into small groups of few students. They may work simultaneously on the same topic but with different material on each table.
Input	Oral or visual stimuli from the formal or informal learning setting.

Integration of Skills	The teaching of the language skills in conjunction with each other, as when a lesson involves activities that relate listening and speaking.
Interaction	Communication between two people.
Learner	A person who is learning a subject or a skill.
Learning Strategy	A way in which a learner attempts to work out the meanings and uses of words, grammatical rules, and other aspects of language.
Learning Styles	The particular way in which the learner tries learning new things. There are four different learning styles.
Mediation	Action of changing events, experiences or sets of circumstances.
Methodology	The study of the whole process of language teaching with the aim of improving its efficiency.
Monitoring	Learners try to correct any errors what they have just said. The teacher may help them to do it by imitating her/him.
Pair-work	Work in which two students perform a task or different tasks simultaneously.
Principle	General rule you follow to achieve something.
Procedure	Action or series of actions to be completed in order to carry out a process.
Process	A series of actions that are carried out in order to achieve a particular result.
Profile	Amount of language learned at the end of the process.

Role –Play	Drama-like classroom activities in which Students take the roles of different participants in the situations. They may act out which might typically happen in that situation.
Skill	Knowledge and ability that enables you to do something well. Linguistic skills enable you to fulfill the communication needs.
Student/Learner	In a communicative approach, a student/learner is the person on whom the learning process is centered. Student learns by doing. She/he becomes an independent and interdependent learner.
Sub-Skills	A division of the skills, such as discriminating sounds in connected speech, understanding relations within a sentence identifying the purpose and scope of a presentation.
Syllabus	An educational program which states: a.) The educational purpose of the program (the ends). b.) The content, teaching procedures and learning experiences which will be necessary to achieve this purpose. c.) Some means for assessing whether or not the educational ends have been achieved.
Tasks	Steps or actions, which are carried out during an activity.
Warm-up	To stimulate the interest and the participation of the learner in an activity.