SECTOR:
COMMERCIAL AND SERVICES

PROGRAM
COMPUTER NETWORKING

CURRICULAR DESIGN ON COMPETENCY BASED-EDUCATION

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San José – Costa Rica

SECTOR:
COMMERCIAL AND SERVICES

PROGRAM:
COMPUTER NETWORKING

ELEVENTH GRADE

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"Al desarrollo por la educación"

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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 NETWORKING

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. The 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.

- Computer Network: The concepts related to the latest equipment technology are integrated. These are very useful for company management. The theory and practice varieties of equipment for existent network on the market. They incorporate necessary upgrades regarding technologies of network and new devices on the market; in order for students to have knowledge and constant upgrading about network to be certified.

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

MSc. Priscilla Arce León.   DANEA.
MSc. Viviana Richmond. (Human Sexuality Integral Education Department)
MSc. Mario Segura Castillo. (Educational Evaluation Department)
MSc. Carlos Rojas Montoya. (Environmental Education Department)

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.

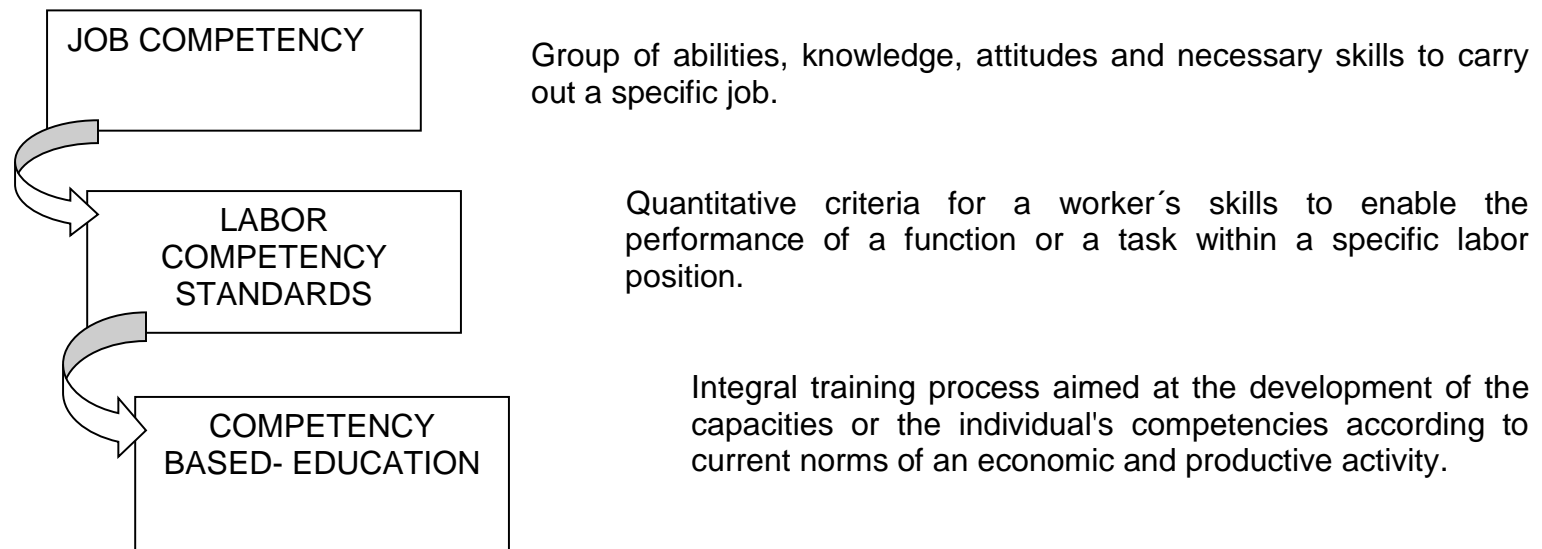meaningful organization of knowledge for the student.

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.

JOB COMPETENCY	Group of abilities, knowledge, attitudes and necessary skills to carry out a specific job.
LABOR COMPETENCY STANDARDS	Quantitative criteria for a worker´s skills to enable the performance of a function or a task within a specific labor position.
COMPETENCY BASED- EDUCATION	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.

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[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.

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[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

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ANNUAL PLAN

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Technical High School: _____

Program: Computer Networking		Subject-area:	Grade: ELEVENTH
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: Commercial And Services	Program: Computer Networking	
Subject Area:	Year:	Grade: ELEVENTH
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.

"Al desarrollo por la educación"

TECHNICAL PROFESSIONAL PROFILE
COMPUTER NETWORKING

- Interprets technical information related to the field.
- 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

The Mid Level Technician of Computer Networking:

- Applies the procedures of drawing different elements of the network using specific software.
- Designs drawings using basic rules for scale management, dimensioned and labeled from the tools of a specific representative.
- Interprets architectural projects and network representations according to their elements.
- Distinguishes basic concepts related to the construction of computers network.
- Installs and configures peripheral equipment and network.
- Installs and configures different types of network cards or wires used in network construction.
- Applies concepts of installation, configuration and expansion of a network.
- Characterizes different operating systems starting from their technical characteristics.
- Explains the method of management processor, the processes and the memory carried out by the operating system.
- Uses the operating system functions for the devices and file management.
- Distinguishes the characteristics of the network-administrator functions and the system used by the operating system.
- Uses entrance, exit and interface functions of some network operating systems.
- Uses accessories and tools for the configuration of some network operating systems.
- Uses some network operating system tools for the administration of users.
- Uses elements of security and auditing of some net operating systems.
- Distinguishes some network operating systems tools for the system management.
- Installs and configures the work environment of some network operating systems.
- Administers bills, groups and impression functions in some network operating systems.
- Assigns security and auditing functions in some network operating systems.
- Executes the processes for improving the performance and optimization of network operating systems.
- Uses native available commands in network operating systems.
- Uses specialized English basic tools for reading and interpreting technical information.
- Applies basic functions of a word processor to write documents.

- Uses tools that presents a spreadsheet to write documents.
- Develops databases using available tools.
- Uses Internet applications and services that are offered to search and access information.
- Designs web pages to publish information on the Internet.
- Makes the connection and installation of different mobile devices and computer equipment.
- Applies algorithms and flow diagrams structured as tools for logical resolution of computer problems.
- Uses symbols to construct algorithms and flow diagrams.
- Distinguishes basic concepts related to structured programming.
- Solves problems using program development elements.
- Builds decision blocks and compound conditions for specific cases.
- Uses procedures and functions as part of specific problem solution.
- Recognizes fundamental elements to use specific syntax of a language oriented to structured programming.
- Makes algorithms for the solution of specific problems using available tools.
- Develops simple programs using selection structures, operators, repetition structures and functions.
- Designs programs with a programming language that contains input and output operations.
- Illustrates the importance of security regarding accident prevention.
- Applies basic norms for waste management and disposal.
- Values the importance of signalling: risk zone and access paths.
- Applies safety standards in diverse activities to prevent accidents at work.
- Distinguishes fire hazards; as well as methods to prevent it in workplaces.
- Distinguishes types of chemical agents people are exposed to at work associated with computer science.
- Applies different techniques to prevent workload problems.
- Applies different techniques to prevent electric risks.
- Elaborates boot and recovery disks as security process of equipment maintenance to update it.
- Distinguishes different adapters used in computers.
- Recognizes administrative process components of the work environment associated with the supporting field.
- Identifies basic elements of the accounting process applied in a microenterprise.
- Elaborates a business plan for a small enterprise in the network area.
- Builds basic budgets related to the work of a network technician.
- Elaborates specific projects related to the network area.

- Recognizes health and safety measures to work with computer equipment and manual tools.
- Identifies fundamental elements associated with databases.
- Describes characteristics of different database models and the normalization process.
- Applies elements related to the use of information for construction and maintenance of databases.
- Uses functions and available tools for building or using databases.
- Uses functions and available tools in the work environment.
- Uses functions and available tools in a visual language environment to control the program.
- Develops programs using modular programming elements in a visual language environment.
- Designs user interfaces using different available tools.
- Elaborates different databases and applications for their management and updating.
- Recognizes components of the administrative process in the work environment associated with computer science.
- Elaborates a business plan for a small company in the computer science area.
- Uses different strategies for management and development of computer projects
- Distinguishes the characteristics and application of telematic services.
- Applies basic principles for using data communication and network.
- Distinguishes the concepts associated with data transmission.
- Applies concepts of network design and structured wiring used in LAN network.
- Uses the concepts of IP, NAT and PAT in the structure of network routing.
- Configures the different device used in network.
- Uses the console line to implement a variety of router configuration commands.
- Uses the routing method for networking devices address messages over the network.
- Recognizes basic principles contained in codes and standards related to structured wiring.
- Applies technical standards in the construction and replacement of wiring systems.
- Recognizes concepts and fundamental elements in network commutation.
- Distinguishes the characteristics of network routing for companies.
- Applies basic principles of network traffic filtration for using control access lists.
- Recognizes necessary principles for problem solutions of a networking company.
- Distinguishes characteristics and operation of available technologies for network.
- Installs and configures different components for the expansion or creation of a network.

- Installs and configures types of network cards and wiring used in the construction of network with different technologies.
- Applies techniques and strategies of network administration and maintenance.
- Distinguishes basic concepts associated with computer security.
- Distinguishes security in different contexts and computer environment.
- Recommends different methods and security techniques related to the systems characteristics and available equipment.
- Relates basic quality principles with daily task development of a specialist in computers.
- Applies concepts related to customer service in job performance related to installation and network configuration.
- Applies basic principles of customer service in work development.

PROGRAM OBJECTIVES
COMPUTER NETWORKING

- 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 desk and portable computers.
- Distinguish basic principles of data communication for designing and implementing network computers.
- Distinguish concepts and fundamental principles of network computers.
- Design and represent computer network according to the customer's specifications depending on the environmental characteristics.
- Apply principles and normative for designing and installing structured wiring systems.
- Apply installation concepts, configuration and expansion of a network.
- Use functions and available tools in network operating systems for its 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 NETWORKING**

SUBJECT AREA	X	XI	XII
Information and Communication Technologies	6		
Programación	8		
Computer Maintenance	8		
English for Communication	2	2	2
Computer Network		18	12
Manipulación de la Información		4	
Network Operating Systems			10
TOTAL	**24**	**24**	**24**

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

CURRICULAR FRAMEWORK
COMPUTER NETWORKING

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

SUBJECT-AREA	UNITS IN EACH LEVEL					
	TENTH	HOURS	**ELEVENTH**	HOURS	**TWELFTH**	HOURS
Manipulación de la Información 4 horas			Bases de datos Introducción a la Programación en Ambiente Visual Gestión Empresarial Total	40 Hrs 60 Hrs <u>60 Hrs</u> 160 Hrs		
Computer Network 18 hours			Data Communication Principles Local Area Network Design and Network Representation Structured Wiring Physical Network Installation Total	108 Hrs 108 Hrs 126 Hrs 126 Hrs <u>252 Hrs</u> 720 Hrs		
Computer Network 12 hours					Network Devices Network Technologies Computer Security Quality Culture Total	120Hrs 60Hrs 60Hrs <u>60Hrs</u> 300Hrs
Network Operating Systems 10 hours					Operating Systems Network User Network Management Total	70Hrs 90Hrs <u>90Hrs</u> 250Hrs

SUBJECT-AREA	UNITS IN EACH LEVEL					
	TENTH	HOURS	**ELEVENTH**	HOURS	**TWELFTH**	HOURS
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. Raising economic success. Total	10 Hrs 10 Hrs 10 Hrs 10 Hrs 10 Hrs 10 Hrs 20 Hrs 80Hrs	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 Hrs 10 Hrs 12 Hrs 12 Hrs 12 Hrs 12 Hrs 12 Hrs 80 Hrs	Day to day work. Customer service. Stand for excellence. Travel. Building an outstanding future career. Total	10 Hrs 10 Hrs 10 Hrs 10 Hrs 10 Hrs 50 Hrs

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CURRICULAR MAP
COMPUTER NETWORKING
TENTH GRADE

SUBJECT- AREA	STUDY BLOCK	LEARNING RESULTS
Information and Communication Technologies 240 hours	Computer basis 24 hours	• Identify concepts, characteristics and elements for developing information and communication technologies. (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. • Solves virus problems in the computer. • Use functions in operating systems for computer hardware and software administration. • Use several tools for environment management in a graphical operating system. • Use tools for resources management. • Apply basic functions of a word processor in the production of documents. • Use spreadsheet tools for document production. • Determine properties and configuration of slide 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	Website 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 on the 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	Occupational 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 & Upgrading Computer 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 follow the preliminary revision and the inventory. • Distinguish 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	Raising 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 NETWORKING
ELEVENTH GRADE

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.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Computer Network 720 hours	Data Communication Principles 108 hours	• Recognize concepts and fundamental elements associated with telephony. • Distinguish telematic services characteristics and applications. • Apply basic principles for data communication and network use. • Recognize concepts associated with data transmission. • Distinguish basic elements of OSI model and TCP/IP used in network building.
	Local Area Network 108 hours	• Identify characteristics of local area network. • Apply concepts of network design and structured wiring used in LAN network. • Use concepts of IP, NAT and PAT in network routing structure. • Configure networks devices. • Use line console to apply commands of router configuration. • Use routing method for network device to send messages through the network. • Identify ISP services available in our country and service providers' responsibilities.

SUBJECT-AREA	STUDY BLOCK	LEARNING RESULTS
Computer Network 720 hours	Design and Network Representation 126 hours	• Apply procedures for drawing network elements used by specific software. • Design sketches using basic rules for labelling scale drawings, using a specific software. • Interpret architectural projects and network representation according to their components.
	Structured Wiring 126 hours	• Identify basic concepts associated with structured wiring. • Identify types of wire, characteristics and applications. • Recognize fundamental contents in the codes and norms related to wiring structure. • Apply technical norms in the construction and replacement of wiring systems.
	Physical Network Installation 252 hours	• Distinguish basic concepts related to building a computer network. • Install and configure peripheral equipment in terminals and network. • Install and configure types of network cards or wiring used in network building. • Apply installation concepts, configuration and expansion of a network. • Apply acquired knowledge, skills, and abilities regarding network by doing an internship.

SUB - AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Manipulación de la Información 160 horas	Bases de Datos 40 horas	• Identificar los elementos fundamentales asociados con las bases de datos. • Describir las características de los diferentes modelos de bases de datos y el proceso de normalización. • Aplicar los elementos relacionados con el manejo de información para la construcción y mantenimiento de bases de datos. • Utilizar las funciones y herramientas disponibles para la creación o manejo de bases de datos.
	Introducción a la Programación en Ambiente Visual 60 horas	• Utilizar las funciones y herramientas disponibles en el entorno de trabajo. • Utilizar las funciones y herramientas disponibles en un lenguaje de ambiente visual para el control del programa. • Desarrollar programas utilizando los elementos de programación modular en un lenguaje de ambiente visual. • Diseñar la interfaz de usuario utilizando las diferentes herramientas disponibles. • Crear diferentes bases de datos y aplicaciones para el manejo o actualización de las mismas.

SUB - AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Manipulación de la Información 160 horas	Gestión Empresarial 60 horas	• Reconocer los componentes del proceso administrativo en el ámbito de trabajo asociado a la informática. • Elaborar un plan de negocio para una micro empresa en el área de informática. • Utilizar diferentes estrategias para la gestión y desarrollo de proyectos informáticos • Aplicar destrezas, habilidades y conocimientos adquiridos referentes a la redes por medio de una pasantía

CURRICULAR MAP
COMPUTER NETWORKING
TWELFTH GRADE

SUBJECT AREA	STUDY BLOCK	LEARNING RESULTS
Computer Network 300 hours	Network Devices 120 hours	• Recognize concepts and basic elements in network switching of a company. • Distinguish characteristics of network routing for companies. • Apply basic principles to filter network traffic by using access control lists. • Analyze principles necessary for the solution of company network problems.
	Network Technologies 60 hours	• Distinguish characteristics and functioning of networking technologies. • Install and configure components for network expansion or creation. • Install and configure different types of network cards and wiring used in building network with technologies. • Apply techniques and strategies for administration and network maintenance.
	Computer Security 60 hours	• Distinguish basic concepts associated with computer security. • Distinguish security in different contexts and computer environment. • Recommend security methods and techniques according to systems and equipment characteristics.

SUBJECT AREA	STUDY BLOCK	LEARNING RESULTS
Computer Network 300 hours	Quality Culture 60 hours	• Relate basic quality principles with the development of daily tasks of computer specialist. • Apply concepts related to customer service performing installation and configuration of network. • Recognize contributions of teamwork for reaching proposed objectives.

SUBJECT AREA	STUDY BLOCK	LEARNING RESULTS
Network Operating Systems 250 hours	Operating Systems 70 hours	• Characterize different operating systems using their technical characteristics. • Explain the administrative method of the processor, the processes, and the memory of its operating system. • Use operating system functions for device and file management. • Distinguish characteristics of the network function manager and the system used by the operating system. • Distinguish the characteristics of currently used main operating systems.
	Network User 90 hours	• Distinguish main characteristics of some network operating systems. • Use entrance functions, exit and interface of some network operating systems. • Use accessories and basic configuration of the network operating system. • Use basic tools of some operating systems for the user´s administration. • Use security and auditing elements of network operating systems.

SUBJECT AREA	STUDY BLOCK	LEARNING RESULTS
Network Operating Systems 250 hours	Network Management 90 hours	• Distinguish tools of some network operating systems for system administration. • Install and configure the work environment of some network operating systems. • Administer bills, groups and impression functions in some network operating systems. • Assign security and audit functions in some network operating systems. • Execute processes for the improvement of the performance and optimization of some network operating systems. • Use native available commands in some network operating 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

ELEVENTH GRADE

SUBJECT– AREA: ENGLISH FOR COMMUNICATION

ELEVENTH LEVEL

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

DISTRIBUTION OF UNITS
ENGLISH FOR COMMUNICATION

Eleventh Level

Units	Name	Time in hours	Weeks per study block
1	Safe Work	10 hrs	5 weeks
2	Introductions in the business activities	10 hrs	5 weeks
3	Regulations, rules and advice.	12 hrs	6 weeks
4	Complaints and solving problems.	12 hrs	6 weeks
5	Following instructions from manual and catalogs.	12 hrs	6 weeks
6	Making telephone arrangements.	12 hrs	6 weeks
7	Entertaining	12 hrs	6 weeks
	Total	80 hrs	40 weeks

Subject area: English for communication		Grade: Eleventh
Unit 1: **Safe work**		Hours per unit: 10 hours
Cognitive target: Exchanging information about: safe and unsafe driving, accidents and job benefits**.**		

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Giving reasons for being late at work, school or meeting. • Identifying different signs and prevention procedures. **SPEAKING** • Describing consequences of accidents and prevention procedures at work. • Identifying special clothes and equipment used at work.	**Functions** • Avoiding dangerous situations at work. • Acquiring and giving information. • Interpreting and communicating information. • Conveying ideas in writing.	**The students:** • Study different signs used for prevention. • Interpret the meaning of universal warnings. • Give prevention procedures. • Explain how to avoid accidents at work. • Role-play using difficult situations at work and what to do, to prevent them or face them.	• Discipline at work. • Order and cleanness at work. • Friendship.	**The students:** • Give reasons for being late at work, school or a meeting by performing the situation in the class. • Identifying different signs and prevention procedures. • Describe prevention measures to avoid traffic accidents or accidents at work. • Identify special clothes and equipment used at work.

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Scanning for specific information related to safety at work. • Reading stories about accidents at work and prevention measures. **WRITING** • Describe the advantages of working in a company.	**Language** • Past continuous • Past continuous with when clauses. • Wh-questions with the past continuous. • Past continuous with while clauses.	**The students:** • Present some procedures to follow in case of an accident at work. • Read about worker´s compensation in case of accident. • Write an accident description. • Fill out an employee accident report.	• Discipline to perform different tasks. • Love for working. • Respect for others.	**The students:** • Scan for specific information related to safety at work. • Read stories about accidents and at work and prevention measures. • Describe the advantages of working in a company.

Subject area: English for communication	Grade: Eleventh
Unit 2: **Introductions in the business activities.**	Hours per unit: 10 hours
Cognitive target: Interprets and communicates information about: Business activities.	

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Comparing the increasing profitability of department stores in our country. **SPEAKING** • Discussing conditions for starting new business in public and private sector companies.	**Functions** • Dealing with numbers. -millions -billions -trillions • Choosing a location for a new factory.	**The students:** • Listen to descriptions and dialogues about people´s future businesses. • Perform given instructions. • Role-play situations such as interviews, dialogues in a company where the participants represent the boss, the secretary, the board of directors discussing the conditions to start a business situation.	• Attitudes toward money. • Tolerance for others.	**The students:** • Compare the increasing profitability of department stores in our country. • Discuss conditions for starting new business in public and private sector companies.

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES

• Making predictions about products or services of the future.
 	
READING
 	
• Reading about the development of industries.
 	
WRITING
 	
• Providing advice for people who are starting new business by writing a letter.
	Language
	
	• Economic terms
	  - interest rate.
	  - Exchange rate
	  - Inflation
	  - Labor force
	  - Tax incentives
	  - Foreign investment
	  - Balance of trade
	
	• Time clauses
	• Future tenses
	• Present continuous for future
		The students:
		
		• Interview people to collect the necessary information.
		
		• Develop reading comprehension skills by doing different exercises.
		
		• Develop writing skills by composing different types of letters
			• Respect for other people's way of expressing themselves.
			
			• Good manners when dealing with other people' requests.
				The students:
				• Make predictions about products or services of the future.
				
				• Read about the development of industries.
				
				• Provide advice for people who are starting new business.

Subject area: English for communication	Grade: Eleventh
Unit 3: **Regulations, rules and advice.**	Hours per unit: 12 hours
Cognitive target: Interprets and communicates information about: workplace rules and following them.	

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Discussing situations when foreign business people make a "cultural mistake." **SPEAKING** • Talking to a manager about not following rules by performing a conversation. • Comparing companies´ regulations and giving advice.	**Functions** • Understanding rules. • Distinguishing cultural patterns. • Acquiring and evaluating information. • Reading with understanding. • Speaking clearly. • Listening actively.	**The students:** • Listen carefully to different scripts read by the teacher about working rules. • Discuss about a workplace safety rules and why they are important. • Talk about rules, regulation and give advice.	• Follow rules in public places.	**The students:** . • Discuss situations when foreign business people make a "cultural mistake." • Talk to a manager about not following rules by performing a conversation. • Compare companies´ regulations and giving advice

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Learning about dress code in my country to put it into practice at school or work. **WRITING** • Writing employee dress-code rules to be applied in a company.	**Language** • May and can to indicate that something is allowed. • May not and can not to indicate prohibition. • Must and have to for necessity. • Must not for prohibition. • Don't have to for lack of necessity.	**The students:** • Practice intonation in statements when reading a text. • Writing paragraphs about school rules.	• Read sign in a park and follow instructions	**The students:** • Learn about dress code in my country to put it into practice at school or work. • Write employee dress-code rules to be applied in a company.

Subject area: English for communication	Grade: Eleventh
Unit 4: **Complaints and solving problems**	Hours per unit: 12 hours
Cognitive target: Exchanging information about: making complaints, apologizing and solving problems	

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Learning how to deal with a complaint by voice mail and automated telephone information. **SPEAKING** • Apologizing when it is required. • Solving problems at the office	**Functions** • Choosing the correct action to respond to an emergency. • Maintaining and troubleshoots technology. • Understanding systems. • Interpreting and communicating information. • Applying technology to a task. • Selecting technology.	**The students:** • Listen to input language • Identify basic vocabulary from oral and visual stimuli. • Perform instructions given by the teacher or partners. • Match meanings with visual images such as pictures, drawings and charts.	• Solve problems at the school, house or work.	**The students:** • Learn how to deal with a complaint by voice mail and automated telephone information. • Apologize when it is required. • Solve problems at the office

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Dealing with problems, client´s complains and giving apologizes • Comprehending the usage of items in a first-aid kit. **WRITING** • Writing about solutions to a problem at work or school.	**Language** • Present real conditionals. • In case…. • Future real conditionals. • First aid. • Office machines. • Machines at school. • Notices. • Other machines or devices.	**The students:** • Describe how to use machines and devices step by step. • Operating different type of machines.	• Friendliness with others. • Self-respect for others.	**The students:** • Deal with problems, clients complains and giving apologizes • Comprehend the usage of items in a first-aid kit. • Write about solutions to a problem at work or school.

Subject area: English for communication			Grade: Eleventh	
Unit 5: **Following instructions from manuals and catalogs.**			Hours per unit: 12 hours	
Cognitive target: Interprets and communicates information about: technical vocabulary related to manuals and catalogues instructions.				

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Understanding or using appropriate language for informational purposes. **SPEAKING** • Comparing equipment used in a job taken from different catalogues.	**Functions** • Identifying equipment from technical catalogues. • Identifying components from technical catalogues. • Advantages and disadvantages in the field. • Comparing different equipment at work. • Directing how to perform a task based on catalogues´ instructions.	**The students:** • Participate in oral and written exercises using vocabulary according to the field of study. • Interpret directions from a pamphlet to carry out a specific task. • Give oral reports about equipments, components and how to use them.	• Friendship	**The students:** • Understand or use appropriate language for informational purposes. • Compare equipment used in a job taken from different catalogues.

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Identifying different equipment and components in catalogues used in a specific field of study. **WRITING** • Interpreting written instructions from a technical manual in a specific field of study	**Language** • Machines at school. • Vocabulary about a specific field of study. • Different kinds of machines at work. • Written and oral Instructions in the field.	**The students:** • Scan for specific information in a reading passage. • Define different uses of equipment and devices used at work. • Identify brands, characteristics, prices and advantages of equipment and devices. • Talk about advantages and disadvantages of equipment. • Role-play situations about equipment sales and devices. • Ask and answer questions about equipment and components used at work.	• Discipline at work. • Order and cleanness at work.	**The students:** • Identify different equipment and components in catalogues used in a specific field of study. • Interpret written instructions from a technical manual in a specific field of study

Subject area: English for communication		Grade: Eleventh
Unit 6: **Making telephone arrangements**		Hours per unit: 12 hours
Cognitive target: Exchanging information about: telephone calls and arrangements.		

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Exchanging information in telephone conversations **SPEAKING** • Expressing fluently to leave and take a message. • Making an appointment by telephone.	**Functions** • Answering the phone when you are at work, at home, at a hotel room. • Answering your mobile phone. • Making appointments. • Arranging a business meeting. • Exchanging information by telephone. • Responding to telephone messages.	**The students:** • Listen to conversations and pay attention to solve some of the problems people have when answering the phone. • Role play a caller and receptionist by taking turns performing different situations.	• Love for working. • Discipline to perform actions.	**The students:** • Exchange information in telephone conversations. • Express fluently to leave and take a message. • Make an appointment by telephone.

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Comparing the different ways of communication people use in one culture such as expressions or gestures that people from another culture might not understand. **WRITING** • Writing a paragraph about how culture affects business life.	**Language** • Phrasal verb (verb + preposition) • Phone verbs: -to get through -to put through -to cut off -to hang up -to hold on -to connect -to be concerned -to disconnect -to wait -to put down the receiver. • Modals for request. -Can we meet on Tuesday? -Could I speak to …? -May I have your name, please? -Can you hold, please?	**The students:** • Distinguish the variety of telephone phrases when: -Asking to speak to someone. -asking someone to wait. -asking for the person´s name. -saying that you ´ll phone again later. • Read about trends in cell phones use and discuss their own use by bringing magazine advertisements for cell phones to class. • Read an e-mail, and then write your own response to a telephone message.	• Respect for others.	**The students:** • Compare the different ways of communication people use in one culture such as expressions or gestures that people from another culture might not understand. • Write a paragraph about how culture affects business life.

Subject area: English for communication	Grade: Eleventh
Unit 7: **Entertaining!**	Hours per unit: 12 hours
Cognitive target: Demonstrate ability to work cooperatively with others.	

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
LISTENING • Entertaining guests and promote leisure activities. • Listening to information about TV schedule **SPEAKING** • Discussing about corporate entertaining.	**Functions** • Taking a guest to dinner. • Making invitations • Describing food. • Greetings and small talk. • Organizing types of events	**The students:** • Complete a personal timeline. • Take conversation notes. • Talk about activities with surprise and empathy.	• Punctuality. • Dependability. • Recognize cultural differences.	**The students:** • Entertain guests and promote leisure activities. • Listen to information about TV schedule • Discuss about corporate entertaining.

LINGUISTIC ACHIEVEMENTS	CONTENT (FUNCTIONS AND LANGUAGE)	PROCEDURES	VALUES AND ATTITUDES	LEARNING OUTCOMES
READING • Reading a journal about a trip on magazine descriptions. **WRITING** • Organizing a conference at another country including a variety of aspects.	**Language** • Past perfect tense to express an action which occurred before another past action. • Past Perfect continuous. • Use so or such with adjectives. • Use adverbial clauses of time with when, as soon as, before, after and until in order to establish a time sequence. • Words for talking about eating and drinking. • Dating • Outings. • Media	**The students:** • Read and discuss the entertainment section of the newspaper to make selections. • Developing different types of reading skills • Developing different types of writing skills on the following topics: - how to make the conference abroad successful - The staff should be friendly and helpful. - All equipment in the conference room should work. - The quality of the food in the restaurants and the speed of service.	• Sociability • Teamwork. • Leadership.	**The students:** • Reading a journal about a trip on magazine descriptions. • Organize a conference at another country including a variety of aspects.

SUBJECT AREA: COMPUTER NETWORK

SUBJECT AREA: COMPUTER NETWORK

DESCRIPTION

The computer technician specializing in computer networks is capable of installing and maintaining peripheral devices; as well as, terminals and servers in the local area networks. Likewise, the ability to infer and analyze diagnose criteria and select them.

The subject area Computer Networks introduces students to the main theoretical and methodological aspects inherent to the transference of data such as: distributed processing, local area networks, which include concepts associated with protocol, capability, configuration, construction, large and medium coverage networks (WAN and MAN), and the OSI/ISO model for local networks.

The subject area is divided into five study blocks; data communication principles, local area networks, design and network representation, structured wiring, and actual network installation.

GENERAL LEARNING RESULTS

Develop knowledge, ability, and skills in the students in order to:

- Distinguish the fundamental elements in the process of data communication.
- Distinguish the characteristics, operation, and components of various topologies, presented in the local network area.
- Create the design and representation of different types of networks, according to the architectural characteristics of the physical plant.
- Design and implement systems of structured wiring.
- Carry out the installation, configuration, and expansion of small networks.

DISTRIBUTION OF STUDY BLOCK

COMPUTER NETWORK

Study blocks	Name	Time in hours	Weeks per study block
I.	Data Communication Principles	108	6
II.	Local Area Networks	108	6
III.	Design and Network Representation	126	7
IV.	Structured Wiring	126	7
V.	Physical network Installation	252	14
	TOTAL	720	40

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Data Communication Principles
Purpose: Distinguish the fundamental elements in the process of data communication.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Adequately mentions basic concepts related to telephony.	Specific
Effectively explains switched telephone systems.	Specific
Accurately recognizes operation of private switched telephone exchanges.	Specific
Rightly differentiates various systems used for the transmission of telephony.	Specific
Rightly understands concepts and characteristics of telematics.	Specific
Recognizes fundamental elements intervening in data transmission effectively.	Specific
Accurately distinguishes characteristics present in types of data transmission	Specific
Precisely applies standards present in the market related to data transmission in specific cases	Specific
Efficiently identifies basic concepts of data and networking communication.	Specific
Correctly explains operation of communication and networking systems.	Specific
Rightly distinguishes characteristics of data and networking communications.	Specific
Accurately classifies the types of systems and networks.	Specific
Correctly defines basic concepts related to data transmission.	Specific
Accurately identifies transference modes and related services.	Specific
Clearly explains modulation processes and signals switching.	Specific
Efficiently identifies procedures for detection and error correction.	Specific
Correctly defines basic concepts related to the OSI and TCP/IP models.	Specific
Clearly recognize characteristics and uses of the OSI and TCP/IP models.	Specific
Effectively describes characteristics of layers of the OSI model.	Specific
Clearly relates the uses of layers of the OSI model to their use in network construction.	Specific

Competency Elements

Reference	Title of the element
2 – 1	Distinguish fundamental elements in data communication.

Performance criteria:

1. Recognize concepts and fundamental elements associated with telephony.
2. Distinguishes telematic services characteristics and applications.
3. Applies basic principles for data communication and network use.
4. Recognizes concepts associated with data transmission.
5. Distinguishes basic elements of OSI model and TCP/IP used in network building.

Application Field:

Category	Class
Services	Provision of Technical Education Services

Performance Evidence:
1. Explains switched telephone systems.
2. Recognizes operation of private switched telephone exchanges.
3. Understands concepts and characteristics of telematics.
4. Recognizes fundamental elements intervening in data transmission.
5. Distinguishes the characteristics present in different types of data transmission.
6. Distinguishes the characteristics of data and network communications.
7. Classifies the types of systems and networks.
8. Explains modulation processes and switching by signals.
9. Describes the characteristics of different layers of the OSI model.
10. Relates the uses of different layers of the OSI model with their use in network construction.

Knowledge Evidence:
1. Mentions basic concepts related to telephony.
2. Differentiates various systems used for the transmission of telephony
3. Identifies the basic concepts of data and network communication.
4. Explains the operation of communication and network systems.
5. Defines the basic concepts related with data transmission.
6. Identifies transference modes and related services.
7. Identifies procedures for detection and error correction.
8. Defines the basic concepts related to the OSI and TCP/IP models.
9. Recognize characteristics and uses of the OSI and TCP/IP models.

Product Evidence:

1. Applies standards present in the market in relation to data transmission in specific cases.

Sector: Commercial and Services	Program: Computer Networking
Subject area: Computer Network	Grade: Eleventh
Study block: Data Communications Principles	Time: 108 hours
Purpose: Distinguish the fundamental elements in the process of data communication	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Recognize concepts and fundamental elements associated with telephony.	• Switched telephone system: • Telephone networks • Subscribers and links • Switching • Switching equipments • Structure of telephone network • Telephone systems • Telephone equipment • Telephone services • Intelligent networks	Teacher: • Defines basic concepts related to telephony. • Explains the operation of private switched telephone exchanges. • Characterizes different transmission systems used for telephony. • Exemplifies characteristics and operation of mobile and cellular telephone systems.	• Awareness of our surroundings and develop ability to predict events.	• Recognizes concepts and fundamental elements associated with telephony.

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

	• Mobile and cellular telephony:
	  • Telephony via radio
	  • Cellular systems
	  • Automatic mobile telephony
	  • TDMA systems
	  • Wireless telephony
	• Digital networks and emergent technologies:
	  • Signal digitalization
	  • Digital links systems
	  • Transference modes
	  • Synchronous
	  • Asynchronous
	  • Digital network of integrated RSDI-services
		Student:
		
		• Mentions basic concepts related to telephony.
		• Explains switched telephone systems.
		• Recognizes operation of private switched telephone exchanges.
		• Differentiates various systems used for the transmission of telephony.		

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

2. Distinguish telematic services characteristics and applications.	• Telematics:
	  • Concept
	  • Characteristics
	  • Required infrastructure
	• Data transmission:
	  • Application of switching techniques
	  • Equipment required
	  • Modems
	  • Multiplexors
	  • Characteristics
	  • Series and parallel
	  • Duplex and semi-duplex
	  • Asynchronous and synchronous
	  • On 2 and 4 wires
	  • Modulation techniques
	  • Band width and transmission speed
	  • Market standards
		Teacher:
		• Identifies fundamental elements in data transmission.
		• Explains characteristics presented by types of data transmission.
		• Illustrates the relation between band width and transmission speed.
		• Exemplifies viable standards in the market in relation to data transmission.
			• Awareness of our surroundings and develop ability to predict events.	• Distinguishes telematic services, characteristics, and applications.

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

	• Communication Protocols:
	  • Concept
	  • Characteristics
	  • Functions
	  • Information code
	  • Classification:
	    • BSC
	    • HDLC/SDLC
	    • TCP/IP
	    • SLIPP/PPP
	    • SNMP
		<u>Student:</u>
		• Understands concepts and characteristics of telematics.
		• Recognizes fundamental elements intervening in data transmission.
		• Distinguishes characteristics present in types of data transmission.
		• Applies standards present in the market related to data transmission in specific cases.		

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

3. Apply basic principles for data communication and network use.	• Data Communication:
	  • Concept
	  • Types of data communication systems
	  • Applications
	  • Analogical and digital communication interfaces
	• Networks:
	  • Concept
	  • Utilities and applications
	  • Characteristics
	  • Types WAN, MAN, LAN
	  • Public and private networks
		Teacher:
		• Defines the basic communication concepts of data and networking.
		• Explains the operation of communication and networking systems.
		• Identifies the utilities and applications of both concepts.
		• Illustrates the operation of communication and networking systems.
			• Awareness of everything that surrounds us with the ability to anticipate events	• Applies basic principles for data communication and network use.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies basic concepts of data and networking communication. • Explains operation of communication and networking systems. • Distinguishes characteristics of data and networking communications. • Classifies types of systems and networks.		

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

4. Recognize concepts associated with data transmission.	• Data Transmision
	• Protocolos
	• Interface
	• Data transfer mode
	  • Simplex
	  • Hafl- duplex
	  • Duplex
	• Connection-oriented and non-connection oriented services:
	• Types of connection
	• Point to point
	• Multipoint
	• Types of modulation and signal switching
	• Switching and dedicated lines.
	• Synchronous and asynchronous transmission
		Teacher:
		• Defines basic concepts related to data transmission.
		• Describes transfer modes and related transfer services.
		• Exemplifies the signals of modulation and switching processes.
		• Classifies the lines and types of transmission used.
			• Awareness of everything that surrounds us with the ability to anticipate events.	• Recognizes concepts associated with data transmission.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	• Detection and correction of errors • Broadband • Baseband • Characteristics and examples	Student: • Defines basic concepts related to data transmission. • Identifies transference modes and related services. • Explains modulation processes and signals switching. • Identifies procedures for detection and error correction.		

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

5. Distinguish basic elements of OSI model and TCP/IP used in network building.	• OSI reference model:
	  • Concept
	  • Characteristics
	  • Uses and applications
	  • Layers:
	    • Physics
	    • Links
	    • Network
	    • Transportation
	    • Session
	    • Application
	• TCP/IP:
	  • Concept
	  • Characteristics
	  • Uses and Applications
		Teacher:
		• Defines basic concepts related to both models.
		• Describes characteristics of different layers of the OSI model.
		• Exemplifies uses of different layers of the OSI model.
		• Compares both models.
		• Discussion about advantages and disadvantages presented by each model.
			• Awareness of everything that surrounds us with the ability to anticipate events	• Distinguishes basic elements of OSI model and TCP/IP used in network building.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Defines basic concepts related to the OSI and TCP/IP models. • Recognize characteristics and uses of the OSI and TCP/IP models. • Describes characteristics of layers of the OSI model. • Relates the uses of layers of the OSI model to their use in network construction.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

STUDY BLOCK: Data Communication Principles	PRACTICE No. 1

Purpose:

Scenario: Classroom	Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures:

Teacher:

- Defines basic concepts related to telephony.
- Explains the operation of private switched telephone exchanges.
- Characterizes different transmission systems used for telephony.
- Exemplifies characteristics and operation of mobile and cellular telephone systems.
- Identifies fundamental elements in data transmission.
- Explains characteristics presented by types of data transmission.
- Illustrates the relation between band width and transmission speed.
- Exemplifies viable standards in the market in relation to data transmission.
- Defines the basic communication concepts of data and networking.
- Explains the operation of communication and networking systems.
- Identifies the utilities and applications of both concepts.
- Illustrates the operation of communication and networking systems.
- Defines basic concepts related to data transmission.
- Describes transfer modes and related transfer services.
- Exemplifies the signals of modulation and switching processes.
- Classifies the lines and types of transmission used.
- Defines basic concepts related to both models.
- Describes characteristics of different layers of the OSI model.
- Exemplifies uses of different layers of the OSI model.
- Compares both models.
- Discussion about advantages and disadvantages presented by each model.
- Defines basic concepts related to the OSI and TCP/IP models.
- Recognize characteristics and uses of the OSI and TCP/IP models.
- Describes characteristics of layers of the OSI model.
- Relates the uses of layers of the OSI model to their use in network construction.

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 mentions basic concepts related to telephony.			
Effectively explains switched telephone systems.			
Accurately recognizes operation of private switched telephone exchanges.			
Rightly differentiates various systems used for the transmission of telephony.			
Rightly understands concepts and characteristics of telematics.			
Recognizes fundamental elements intervening in data transmission effectively.			
Accurately distinguishes characteristics present in types of data transmission			
Precisely applies standards present in the market related to data transmission in specific cases			
Efficiently identifies basic concepts of data and networking communication.			
Correctly explains operation of communication and networking systems.			
Rightly distinguishes characteristics of data and networking communications.			
Accurately classifies the types of systems and networks.			
Correctly defines basic concepts related to data transmission.			
Accurately identifies transference modes and related services.			
Clearly explains modulation processes and signals switching.			
Efficiently identifies procedures for detection and error correction.			

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Correctly defines basic concepts related to the OSI and TCP/IP models.			
Clearly recognized characteristics and uses of the OSI and TCP/IP models.			
Effectively describes characteristics of layers of the OSI model.			
Clearly relates the uses of layers of the OSI model to their use in network construction.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Recognize concepts and fundamental elements associated with telephony.	Recognize concepts and fundamental elements associated with telephony.	Mentions basic concepts related to telephony.	Knowledge	Adequately mentions basic concepts related to telephony.
		Explains switched telephone systems.	Performance	Effectively explains switched telephone systems.
		Recognizes operation of private switched telephone exchanges.	Performance	Accurately recognizes operation of private switched telephone exchanges.
		Differentiates various systems utilized for the transmission of telephony.	Knowledge	Rightly differentiates various systems used for the transmission of telephony.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Distinguish telematic services characteristics and applications.	Distinguishes telematic services characteristics and applications.	Mentions the concept and characteristics of telematics.	Performance	Rightly understands concepts and characteristics of telematics.
		Recognizes fundamental elements intervening in data transmission.	Performance	Recognizes fundamental elements intervening in data transmission effectively.
		Distinguishes the characteristics present in different types of data transmission.	Performance	Accurately distinguishes characteristics present in types of data transmission
		Applies standards present in the market in relation to data transmission in specific cases.	Product	Precisely applies standards present in the market related to data transmission in specific cases

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Apply basic principles for data communication and network use.	Applies basic principles for data communication and network use.	Identifies the basic concepts of data and network communication.	Knowledge	Efficiently identifies basic concepts of data and networking communication.
		Explains the operation of communication and network systems.	Knowledge	Correctly explains operation of communication and networking systems.
		Distinguishes the characteristics of data and network communications.	Performance	Rightly distinguishes characteristics of data and networking communications.
		Classifies the types of systems and networks.	Performance	Accurately classifies the types of systems and networks.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCY
Recognize concepts associated with data transmission.	Recognizes concepts associated with data transmission.	Defines the basic concepts related with data transmission.	Knowledge	Correctly defines basic concepts related to data transmission.
		Identifies transference modes and related services.	Knowledge	Accurately identifies transference modes and related services.
		Explains modulation processes and switching by signals.	Performance	Clearly explains modulation processes and signals switching.
		Identifies procedures for detection and error correction.	Knowledge	Efficiently identifies procedures for detection and error correction.
Distinguish basic elements of OSI model and TCP/IP used in network building.	Distinguishes basic elements of OSI model and TCP/IP used in network building.	Defines the basic concepts related to the OSI and TCP/IP models.	Knowledge	Correctly defines basic concepts related to the OSI and TCP/IP models.
		Recognize characteristics and uses of the OSI and TCP/IP models.	Knowledge	Clearly recognize characteristics and uses of the OSI and TCP/IP models.
		Describes the characteristics of different layers of the OSI model.	Performance	Effectively describes characteristics of layers of the OSI model.
		Relates the uses of different layers of the OSI model with their use in network construction.	Performance	Clearly relates the uses of layers of the OSI model to their use in network construction.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Local Area Networks
Purpose: Characteristics, operation, and components of the different topologies present in the Local Area
                         Networks.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly defines basic concepts of LAN.	Specific
Accurately describes its functions.	Specific
Adequately recognizes the characteristics of distributed systems.	Specific
Effectively explains the operation and characteristics of topologies of a network.	Specific
Correctly explains basic concepts of the network design.	Specific
Correctly distinguishes devices of LAN networks.	Specific
Effectively distinguishes devices of internetwork.	Specific
Rightly explains the dependability and availability concepts of internet devices.	Specific
Accurately mentions basic concepts of IP addressing in LAN.	Specific
Effectively explains sub-network and its types.	Specific
Adequately recognizes uses of NAT and PAT in the translation of network addresses.	Specific
Effectively classifies uses for translation of addresses using NAT and PAT.	Specific
Correctly defines concepts related to the initial configuration of the router.	Specific
Rightly identifies steps for configuration in and out of the band.	Specific
Effectively recognizes ISR with SDM configurations.	Specific
Exactly understands steps for the use of the configuration programming consoles with commands.	Specific
Effectively defines basic concepts for CLI use in a router.	Specific
Exactly identifies characteristics of show commands and basic configuration.	Specific
Adequately illustrates services to be installed in a router, such as DHCP, NAT.	Specific
Adequately Illustrates configurations for the WAN connections.	Specific

Correctly mentions basic concepts related to router configuration with SSH.   Specific
Rightly explains characteristics to enable routing protocols.   Specific
Accurately illustrates protocol configurations.   Specific
Exactly recognizes protocol operation by verification when installing each protocol.   Specific
Rightly mentions concepts and characteristics of TCP/IP protocols.   Specific
Rightly illustrates the use of DNS services and support for HTTP, FTP, SMTP, POP3, and IMPAP.   Specific
Effectively demonstrates ISP using data encryption.   Specific
Exactly describes use of security copies for disaster recovery.   Specific

Competency Elements

Reference	Title of the element
2 – 2	Characteristics, operation, and the components of the different topologies present in the Local Area Networks.

Performance criteria:
1. Identifies characteristics of local area network.
2. Applies concepts of network design and structured wiring used in LAN network.
3. Uses concepts of IP, NAT and PAT in network routing structure.
4. Configures networks devices.
5. Uses line console to apply commands of router configuration.
6. Uses routing method for network device to send messages through the network.
7. Identifies ISP services available in our country and the service providers' responsibilities.

Application Field:

Category	Class
Services	Provision of Technical Education Services

Performance Evidence:
1. Describes its functions.
2. Explains the operation and characteristics of topologies of a network.
3. Distinguishes devices of LAN networks.
4. Distinguishes devices of internetwork.
5. Explains sub-network and its types.
6. Recognizes uses of NAT and PAT in the translation of network addresses.
7. Classifies uses for translation of addresses using NAT and PAT.
8. Identifies steps for configuration in and out of the band.
9. Recognizes ISR with SDM configurations.
10. Understands steps for the use of the configuration programming consoles with commands.
11. Identifies characteristics of show commands and basic configuration.
12. Illustrates services to be installed in a router, such as DHCP, NAT.
13. Illustrates configurations for the WAN connections.
14. Illustrates protocol configurations.
15. Recognizes protocol operation by verification when installing each protocol.

Knowledge Evidence:
1. Defines basic concepts of LAN.
2. Recognizes the characteristics of distributed systems.
3. Explains basic concepts of the network design.
4. Explains the dependability and availability concepts of internet devices.
5. Mentions basic concepts of IP addressing in LAN.
6. Defines concepts related to the initial configuration of the router.
7. Defines basic concepts for CLI use in a router.
8. Mentions basic concepts related to router configuration with SSH.
9. Explains characteristics to enable routing protocols.
10. Mentions concepts and characteristics of TCP/IP protocols.
11. Describes use of security copies for disaster recovery.

Product Evidence:

1. Illustrates the use of DNS services and support for HTTP, FTP, SMTP, POP3, and IMPAP.
2. Demonstrates ISP using data encryption.

Sector: Commercial and Services	Program: Computer Networking
Subject area: Computer Network	Grade: Eleventh
Study block: Local Area Networks	Time: 108 hours
Purpose: Characteristics, operation, and components of the different topologies present in the Local Area Networks	

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

1. Identify characteristics of local area network.	• Local area networks (LAN):
	  • Concept
	  • Characteristics
	  • Uses and applications
	  • Evolution
	  • Distributed processing
	  • Construction
	  • Topologies:
	    • Star
	    • Ring
	    • Bus
	    • Reticular or mesh
	    • Logical topologies
	  • Documentation of the network requirements
		Teacher:
		• Defines basic concepts of local area networks.
		• Explains the operation of a LAN.
		• Describes characteristics of the distributed systems.
		• Demonstrates operation of the different topologies.
			• To have a clear notion of the fundamental rights of each person.	• Identifies characteristics of local area network.

LEARNING RESULTS	CONTENTS	TEACHING AND LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Defines basic concepts of LAN. • Describes its functions. Recognizes the characteristics of distributed systems. • Explains the operation and characteristics of topologies of a network.		

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

2. Apply concepts of network design and structured wiring used in LAN network.	• Web Design:
	  • Physical environment
	  • Wiring considerations
	  • Structured wiring
	  • Web LAN devices
	  • Internetwork devices
	  • Reliability and availability
		Teacher:
		• Defines basic concept of the network design.
		• Explains wiring considerations.
		• Illustrates the devices of LAN networks and internetwork.
		• Explains the concepts of dependability and availability of the internetwork.
		 Student:
		• Explains basic concepts of the network design.
		• Distinguishes devices of LAN networks.
		• Distinguishes devices of internetwork.
		• Explains the dependability and availability concepts of internet devices.
			• To have a clear notion of the fundamental rights of each person	• Applies concepts of network design and structured wiring used in LAN network.

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

3. Use concepts of IP, NAT and PAT in network routing structure.	• IP addressing in the LAN
	   • Addressing IP
	   • Dividing a network into subnets
	   • Types of Subnets IPv6
	 • Nat y PAT:
	   • Translation of web addressing
	   • NAT terminology
	   • NAT static and dynamic
	   • Translation of directions according to PAT port
		Teacher:
		 • Defines basic concepts of IP addressing in LAN.
		 • Describes the sub-networks and their types.
		 • Explains uses of NAT and PAT in translation of network addresses.
		 • Exemplifies translation of NAT and PAT addresses.
			• To have a clear notion of the fundamental rights of each person.	• Uses concepts of IP, NAT and PAT in network routing structure.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Mentions basic concepts of IP addressing in LAN. • Explains sub-network and its types. • Recognizes uses of NAT and PAT in the translation of network addresses. • Classifies uses for translation of addresses using NAT and PAT.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
4. Configure networks devices.	• Initial configuration of an ISR router (Integrated Services Routers) • Configuration of router in and out of the band • IOS Router Programs • Configuration of one ISR with SDM (Security Device Manager) • WAN Serial Connection • NAT dynamic configuration • Interface and command line modes	Teacher: • Defines concepts related to initial configuration of a router. • Describes steps to create configurations in and out of the band. • Explains ISR with SDM configurations. • Exemplifies the use of configuration programming consoles with the use of command lines.	• To have a clear notion of the fundamental rights of each person	• Configures networks devices.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Defines concepts related to the initial configuration of the router. • Identifies steps for configuration in and out of the band. • Recognizes ISR with SDM configurations. • Understands steps for the use of the configuration programming consoles with commands.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
5. Use line console to apply commands of router configuration.	• Use CLI (Command line interface) IOS • Show Commands • Basic configuration • Interface Configuration • Default route • DHCP Services • Static NAT • Router backup. • Initial switch configuration • CPE installation • Configuration of WAN connections	Teacher: • Defines basic concepts for CLI in a router. • Describes characteristics of Show Commands and basic configuration. • Illustrates services to be installed in a router, such as DHCP, NAT. • Illustrates configurations for WAN connections.	• To have a clear notion of the fundamental rights of each person	• Uses line console to apply commands of router configuration.

LEARNING RESULTS	CONTENTS	TEACHING AND LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Defines basic concepts for CLI use in a router. • Identifies characteristics of show commands and basic configuration. • Illustrates services to be installed in a router, such as DHCP, NAT. • Illustrates configurations for the WAN connections.		

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

6. Use routing method for network device to send messages through the network.	• Configuration:
	   ● Router with SSH
	   ● WAN Connections
	• Enable routing protocols
	• RIP Configuration and verification
	• Autonomous Systems
	• Protocols of exterior routing and ISP
	• Routing through Internet
	• BGP configuration and verification
		Teacher:
		• Defines basic concepts related to router configuration SSH.
		• Describes characteristics when enabling the routing protocols.
		• Illustrates the configuration of protocols.
		• Illustrates protocol operations by verification when installing each protocol.
			• To have a clear notion of the fundamental rights of each person.	• Uses routing method for network device to send messages through the network.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Mentions basic concepts related to router configuration with SSH. • Explains characteristics to enable routing protocols. • Illustrates protocol configurations. • Recognizes protocol operation by verification when installing each protocol.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
7. Identify ISP services available in our country and service providers' responsibilities.	• ISP services: • TCP/IP protocols • Differences between TCP and UDP • TCP/IP Host Name • DNS (Servers) • Services and protocols • Support of HTTP and HTTPS, FTP, SMTP, POP3, IMPAP • ISP security: • Data encryption • Security tools (access lists, firewalls, IDS and IPS, host security) • Supervision and administration of ISP • Security copies and disaster recoveries	Teacher: • Explains the concept and characteristics of TCP/IP. • Illustrates use of DNS services and support for HTTP, FTP, SMTP, POP3, and IMPAP. • Illustrates ISP security using data encryption. • Describes use of security copies for disaster recovery.	• To have a clear notion of the fundamental rights of each person.	• Identifies ISP services available in our country and the service providers' responsibilities.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Mentions concepts and characteristics of TCP/IP protocols. • Illustrates the use of DNS services and support for HTTP, FTP, SMTP, POP3, and IMPAP. • Demonstrates ISP using data encryption. • Describes use of security copies for disaster recovery.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

STUDY BLOCK: Local Area networks	PRACTICE No. 1

Purpose:

Scenario: Classroom	Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures:

Teacher:
- Defines basic concepts of local area networks.
- Explains the operation of a LAN.
- Describes characteristics of the distributed systems.
- Demonstrates operation of the different topologies.
- Defines basic concept of the network design.
- Explains wiring considerations.
- Illustrates the devices of LAN networks and internetwork.
- Explains the concepts of dependability and availability of the internetwork.
- Defines basic concepts of IP addressing in LAN.
- Describes the sub-networks and their types.
- Explains uses of NAT and PAT in translation of network addresses.
- Exemplifies translation of NAT and PAT addresses.
- Defines concepts related to initial configuration of a router.
- Describes steps to create configurations in and out of the band.
- Explains ISR with SDM configurations.
- Exemplifies the use of configuration programming consoles with the use of command lines.
- Defines basic concepts for CLI in a router.
- Describes characteristics of Show Commands and basic configuration.
- Illustrate services to be installed in a router, such as DHCP, NAT.
- Illustrates configurations for WAN connections.
- Defines basic concepts related to router configuration SSH.
- Describes characteristics when enabling the routing protocols.
- Illustrates the configuration of protocols.
- Illustrates protocol operations by verification when installing each protocol.
- Explains the concept and characteristics of TCP/IP.
- Illustrates use of DNS services and support for HTTP, FTP, SMTP, POP3, and IMPAP.
- Illustrates ISP security using data encryption.
- Describes use of security copies for disaster recovery.

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 of LAN.			
Accurately describes its functions.			
Adequately recognizes the characteristics of distributed systems.			
Effectively explains the operation and characteristics of topologies of a network.			
Correctly explains basic concepts of the network design.			
Correctly distinguishes devices of LAN networks.			
Effectively distinguishes devices of internetwork.			
Rightly explains the dependability and availability concepts of internet devices.			
Accurately mentions basic concepts of IP addressing in LAN.			
Effectively explains sub-network and its types.			
Adequately recognizes uses of NAT and PAT in the translation of network addresses.			
Effectively classifies uses for translation of addresses using NAT and PAT.			
Correctly defines concepts related to the initial configuration of the router.			
Rightly identifies steps for configuration in and out of the band.			
Effectively recognizes ISR with SDM configurations.			
Exactly understands steps for the use of the configuration programming consoles with commands.			

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Effectively defines basic concepts for CLI use in a router.			
Exactly identifies characteristics of show commands and basic configuration.			
Adequately illustrates services to be installed in a router, such as DHCP, NAT.			
Adequately Illustrates configurations for the WAN connections.			
Correctly mentions basic concepts related to router configuration with SSH.			
Rightly explains characteristics to enable routing protocols.			
Accurately illustrates protocol configurations.			
Exactly recognizes protocol operation by verification when installing each protocol.			
Rightly mentions concepts and characteristics of TCP/IP protocols.			
Rightly illustrates the use of DNS services and support for HTTP, FTP, SMTP, POP3, and IMPAP.			
Effectively demonstrates ISP using data encryption.			
Exactly describes use of security copies for disaster recovery.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify characteristics of local area network.	Identifies characteristics of local area network.	Defines basic concepts of LAN.	Knowledge	Correctly defines basic concepts of LAN.
		Describes its functions.	Performance	Accurately describes its functions.
		Recognizes the characteristics of distributed systems.	Knowledge	Adequately recognizes the characteristics of distributed systems.
		Explains the operation and characteristics of the topologies of a network.	Performance	Effectively explains the operation and characteristics of topologies of a network.
Apply concepts of network design and structured wiring used in LAN network.	Applies concepts about network design and structured wiring used in LAN network.	Explains basic concepts of the network design.	Knowledge	Correctly explains basic concepts of the network design.
		Distinguishes devices of LAN networks.	Performance	Correctly distinguishes devices of LAN networks.
		Distinguishes devices of the Internetwork.	Performance	Effectively distinguishes devices of internetwork.
		Explains the dependability and availability concepts of Internet devices.	Knowledge	Rightly explains the dependability and availability concepts of internet devices.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use concepts of IP, NAT and PAT in network routing structure.	Uses concepts of IP, NAT and PAT in network routing structure.	Mentions the basic concepts of IP addressing in a LAN.	Knowledge	Accurately mentions basic concepts of IP addressing in LAN.
		Explains the sub-network and its types.	Performance	Effectively explains sub-network and its types.
		Recognizes the uses of NAT and PAT in the translation of network addresses.	Performance	Adequately recognizes uses of NAT and PAT in the translation of network addresses.
		Classifies different uses for translation of addresses using NAT and PAT.	Performance	Effectively classifies uses for translation of addresses using NAT and PAT.
Configure networks devices.	Configures networks devices.	Defines the concepts related to the initial configuration of the router.	Knowledge	Correctly defines concepts related to the initial configuration of the router.
		Identifies the steps for the configuration in and out of the band.	Performance	Rightly identifies steps for configuration in and out of the band.
		Recognizes the ISR with SDM configurations.	Performance	Effectively recognizes ISR with SDM configurations.
		Understands the steps for the use of the configuration programming console with the use of commands.	Performance	Exactly understands steps for the use of the configuration programming consoles with commands.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use line console to apply commands of router configuration.	Uses line console to apply commands of router configuration.	Defines basic concepts for CLI use in a router.	Knowledge	Effectively defines basic concepts for CLI use in a router.
		Identifies the characteristics of show commands and basic configuration.	Performance	Exactly identifies characteristics of show commands and basic configuration.
		Illustrates different services to be installed in a router such as DHCP, NAT.	Performance	Adequately illustrates services to be installed in a router, such as DHCP, NAT.
		Illustrates the configurations for the WAN connections.	Performance	Adequately Illustrates configurations for the WAN connections.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use routing method for network device to send messages through the network.	Uses routing method for network device to send messages through the network.	Mentions basic concepts related to router configuration with SSH.	Knowledge	Correctly mentions basic concepts related to router configuration with SSH.
		Explains the characteristics to enable routing protocols.	Knowledge	Rightly explains characteristics to enable routing protocols.
		Illustrates different protocols configurations.	Performance	Accurately illustrates protocol configurations.
		Recognizes the operation of each protocol by means of verification when installing each protocol.	Performance	Exactly recognizes protocol operation by verification when installing each protocol.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify ISP services available in our country and service providers' responsibilities.	Identifies ISP services available in our country and service providers' responsibilities.	Mentions the concept and characteristics of TCP/IP protocols.	Knowledge	Rightly mentions concepts and characteristics of TCP/IP protocols.
		Illustrates the use of DNS services and support for HTTP, FTP, SMTP, POP3, and IMPAP.	Product	Rightly illustrates the use of DNS services and support for HTTP, FTP, SMTP, POP3, and IMPAP.
		Demonstrates ISP by means of data encryption.	Product	Effectively demonstrates ISP using data encryption.
		Describes the use of security copies for disaster recovery.	Knowledge	Exactly describes use of security copies for disaster recovery.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA
Title: Design and Network Representation
Purpose: Create the design and representation of types of the networks regarding architectural characteristics of the plant layout.
Competency Level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

TITLE	Classification
Correctly defines basic concepts related to designing and network representation.	Specific
Effectively recognizes advantages and applications of designing and network representation.	Specific
Effectively identifies designing basic norms and network representation.	Specific
Correctly identifies basic concepts related to elements to be drawn.	Specific
Effectively describes procedures for insertion and elimination of components.	Specific
Effectively uses appropriate software tools.	Specific
Effectively represents different elements.	Specific
Adequately identifies the functions of scales.	Specific
Effectively describes their characteristics	Specific
Effectively uses different scales in drawing designing.	Specific
Correctly identifies elements related to measurement concepts.	Specific
Correctly recognizes measurement applications in the drawing.	Specific
Correctly applies basic measurement norms.	Specific
Correctly uses measurement norms in simple drawings.	Specific
Accurately recognizes the labeling concept used in drawing.	Specific
Rightly identifies norms related to labeling.	Specific
Properly uses available tools and functions in specific software	Specific
Rightly labels drawings.	Specific
Properly identifies characteristics of sketches.	Specific
Accurately describes procedures to design sketches.	Specific

TITLE	Classification
Correctly uses available functions and tools.	Specific
Accurately creates sketches using available tools and functions in specific software.	Specific
Rightly defines concepts related to architectural projects.	Specific
Properly identifies elements included in an architectural project.	Specific
Rightly recognizes components included in an architectural project.	Specific
Correctly interprets information in a given architectural project.	Specific

Competency Elements

Reference	Title of the element
2 – 3	Create the design and representation of different types of the networks regarding architectural characteristics of the plant layout.

Performance criteria:

1. Applies procedures for drawing network elements used by specific software.
2. Designs sketches using basic rules for labelling scale drawings, using a specific software.
3. Interprets architectural projects and network representation according to their components.

Application Field:

Category	Class
Services	Provision of Technical Education Services

Performance Evidence

1. Recognizes advantages and applications of designing and network representation.
2. Uses appropriate software tools.
3. Uses different scales in drawing designing.
4. Recognizes measurement applications in the drawing.

5. Uses measurement norms in simple drawings.
6. Recognizes the labeling concept used in drawing.
7. Uses available tools and functions in specific software.
8. Uses available functions and tools.
9. Recognizes components included in an architectural project.

Knowledge Evidence:
1. Defines basic concepts related to designing and network representation.
2. Identifies designing basic norms and network representation.
3. Describes procedures for insertion and elimination of components.
4. Identifies the functions of scales.
5. Describes their characteristics.
6. Identifies elements related to measurement concepts.
7. Identifies norms related to labeling.
8. Identifies characteristics of sketches.
9. Describes procedures to design sketches.
10. Defines concepts related to architectural projects.
11. Identifies elements included in an architectural project.

Product Evidence:

1. Represents different elements.
2. Applies basic measurement norms.
3. Labels drawings.
4. Creates sketches using available tools and functions in specific software.
5. Interprets information in a given architectural project.

Sector: Commercial and Services	Program: Computer Networking
Subject area: Computer Network	Grade: Eleventh
Study block: Design and Network Representation.	Time: 126 hours

Purpose: Create the design and representation of types of the networks regarding architectural characteristics of the plant layout

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Apply procedures for drawing network elements used by specific software.	• Network design and representation: • Concept • Advantage • Applications • Basic norms for designing network sketches • Software for virtual network creation (Packet Tracer)	Teacher: • Defines basic concepts related to network designing and representation. • Identifies designing advantages, network applications and representation. • Discusses basic designing norms and network representation.	• Awareness of the consequences of our actions and omissions.	• Applies procedures for drawing network elements used by specific software.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Defines basic concepts related to designing and network representation. • Recognizes advantages and applications of designing and network representation. • Identifies designing basic norms and network representation.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Design sketches using basic rules for labelling scale drawings, using a specific software. .	• Drawing procedures: • Basic concepts • Parallels • Perpendiculars • Tangents • Line and angle division • Polygons • Others	Teacher: • Defines basic concepts of drawing procedures. • Describes procedures for insertion and elimination of components. • Selection of adequate software tools. • Representation of different elements.	• Awareness of the consequences of our actions and omissions.	3. Designs sketches using basic rules for labelling scale drawings, using a specific software.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies basic concepts related to elements to be drawn. • Describes procedures for insertion and elimination of components. • Uses appropriate software tools. • Represents different elements.		

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

	• Scales:
	   • Concept
	   • Function
	   • Types
	   • Characteristics
	   • Using scales in drawing
		<u>Teacher:</u>
		 • Defines concept of scales.
		 • Identifies their functions.
		 • Illustrates the use of scales for drawing design.
		 <u>Student:</u>
		 • Identifies the functions of scales.
		 • Describes their characteristics.
		 • Uses different scales in drawing designing.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	• Binding (levels): • Concept • Importance • Application • Basic norms	Teacher: • Defines binding concepts. • Describes the importance of binding application to a drawing. • Applies basic binding norms. • Uses binding for simple drawings. Student: • Identifies elements related to measurement concepts. • Recognizes measurement applications in the drawing. • Applies basic measurement norms. • Uses measurement norms in simple drawings.		

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

	• Labeling:
	  • Concept
	  • Norms
	  • Applications
		Teacher:
		• Identifies norms regarding labeling.
		• Exemplifies the use of tools and functions available in specific software.
		• Uses different tools to label drawings.
		• Labels different types of drawings.
		Student:
		• Recognizes the labeling concept used in drawing.
		• Identifies norms related to labeling.
		• Uses available tools and functions in specific software.
		• Labels drawings.		

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

	• Sketches
	  • Concept
	  • Characteristics
	  • Application
	  • Software
	  • Working window
	  • Menus
	  • Functions and tools
	  • Application of scales and labels
	  • Drawing sketches
		Teacher:
		• Identifies characteristics and applications of sketches.
		• Illustrates the procedure procedures to design sketches.
		• Illustrates functions and available tools.
		• Traces sketches using available tools and functions of specific software.
		Student:
		• Identifies characteristics of sketches.
		• Describes procedures to design sketches.
		• Uses available functions and tools.
		• Creates sketches using available tools and functions in specific software.		

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

3. Interpret architectural projects and network representation according to their components.	• Architectural projects
	  • Architectural plans
	  • Ensembles
	  • Installation structure
	  • Elevations
	  • Architectural details
	  • Structures
	  • Architectural symbols
	  • Electrical
	  • Mechanical
		Teacher:
		• Defines concepts related to architectural projects.
		• Identifies parts of each element.
		• Illustrates components of an architectural project.
		• Reviews architectural projects.
		
		Student:
		• Defines concepts related to architectural projects.
		• Identifies elements included in an architectural project.
		• Recognizes components included in an architectural project.
		• Interprets information in a given architectural project.
			• Awareness of the consequences of our actions and omissions.	• Interprets architectural projects and network representation according to their components.

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Design and network Representation	PRACTICE No. 1

Purpose:

Scenario: Classroom	TIME:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:
- Defines basic concepts related to network designing and representation.
- Identifies designing advantages, network applications and representation.
- Discusses basic designing norms and network representation.
- Defines basic concepts of drawing procedures.
- Describes procedures for insertion and elimination of components
- Selection of adequate software tools.
- Representation of different elements.
- Defines concept of scales.
- Identifies their functions.
- Illustrates the use of scales for drawing design.
- Defines binding concepts.
- Describes the importance of binding.
- Application to a drawing.
- Applies basic binding norms.
- Uses binding for simple drawings.
- Identifies norms regarding labeling.
- Exemplifies the use of tools and functions available in specific software.
- Uses different tools to label drawings.
- Labels different types of drawings.
- Identifies characteristics and applications of sketches.
- Illustrates the procedure procedures to design sketches.
- Illustrates functions and available tools.
- Traces sketches using available tools and functions of specific software.
- Defines concepts related to architectural projects.
- Identifies parts of each element.
- Illustrates components of an architectural project.
- Reviews architectural 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
Correctly defines basic concepts related to designing and network representation.			
Effectively recognizes advantages and applications of designing and network representation.			
Effectively identifies designing basic norms and network representation.			
Correctly identifies basic concepts related to elements to be drawn.			
Effectively describes procedures for insertion and elimination of components.			
Effectively uses appropriate software tools.			
Effectively represents different elements.			
Adequately identifies the functions of scales.			
Effectively describes their characteristics			
Effectively uses different scales in drawing designing.			
Correctly identifies elements related to measurement concepts.			
Correctly recognizes measurement applications in the drawing.			
Correctly applies basic measurement norms.			
Correctly uses measurement norms in simple drawings.			
Accurately recognizes the labeling concept used in drawing.			
Rightly identifies norms related to labeling.			
Properly uses available tools and functions in specific software			
Rightly labels drawings.			
Properly identifies characteristics of sketches.			
Accurately describes procedures to design sketches.			

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Correctly uses available functions and tools.			
Accurately creates sketches using available tools and functions in specific software.			
Rightly defines concepts related to architectural projects.			
Properly identifies elements included in an architectural project.			
Rightly recognizes components included in an architectural project.			
Correctly interprets information in a given architectural project.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	SUFFIENCY OF EVIDENCES
Apply procedures for drawing network elements used by specific software	Applies procedures for drawing network elements used by specific software.	Defines basic concepts related to designing and network representation.	Knowledge	Correctly defines basic concepts related to designing and network representation.
		Recognizes advantages and applications of designing and network representation.	Performance	Effectively recognizes advantages and applications of designing and network representation.
		Identifies designing basic norms and network representation.	Knowledge	Effectively identifies designing basic norms and network representation.
Design sketches using basic rules for labelling scale drawings, using a specific software.	Designs sketches using basic rules for labelling scale drawings, using a specific software.	Describes procedures for insertion and elimination of components.	Knowledge	Effectively describes procedures for insertion and elimination of components.
		Uses appropriate software tools.	Performance	Effectively uses appropriate software tools.
		Represents different elements.	Product	Effectively represents different elements.
		Identifies the functions of scales.	Knowledge	Adequately identifies the functions of scales.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	SUFFIENCY OF EVIDENCES
		Describes their characteristics	Knowledge	Effectively describes their characteristics
		Uses different scales in drawing designing.	Performance	Effectively uses different scales in drawing designing.
		Identifies elements related to measurement concepts.	Knowledge	Correctly identifies elements related to measurement concepts.
		Recognizes measurement applications in the drawing.	Knowledge	Correctly recognizes measurement applications in the drawing.
		Applies basic measurement norms.	Product	Correctly applies basic measurement norms.
		Uses measurement norms in simple drawings.	Performance	Correctly uses measurement norms in simple drawings.
		Recognizes the labeling concept used in drawing.	Performance	Accurately recognizes the labeling concept used in drawing.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	SUFFIENCY OF EVIDENCES
		Identifies norms related to labeling.	Knowledge	Rightly identifies norms related to labeling.
		Uses available tools and functions in specific software	Performance	Properly uses available tools and functions in specific software
		Labels drawings.	Product	Rightly labels drawings.
		Identifies characteristics of sketches.	Knowledge	Properly identifies characteristics of sketches.
		Describes procedures to design sketches.	Knowledge	Accurately describes procedures to design sketches.
		Uses available functions and tools.	Performance	Correctly uses available functions and tools.
		Creates sketches using available tools and functions in specific software.	Product	Accurately creates sketches using available tools and functions in specific software.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	SUFFIENCY OF EVIDENCES
Interpret architectural projects and network representation according to their components.	Interprets architectural projects and network representation according to their components.	Defines concepts related to architectural projects.	Knowledge	Rightly defines concepts related to architectural projects.
		Identifies elements included in an architectural project.	Performance	Properly identifies elements included in an architectural project.
		Recognizes components included in an architectural project.	Performance	Rightly recognizes components included in an architectural project.
		Interprets information in a given architectural project.	Product	Correctly interprets information in a given architectural project.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Structured wiring
Purpose: Design and implement structured wiring systems.
Competency Level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

TITLE	Classification
Correctly mentions concepts associated with structured wiring.	Specific
Effectively recognizes technical characteristics in structured wiring.	Specific
Accurately identifies functions structured wiring in the installation of systems.	Specific
Effectively characterizes structured wiring systems.	Specific
Rightly mentions basic concepts associated with cables and connectors in structured wiring.	Specific
Correctly recognizes their characteristics.	Specific
Adequately explains their uses and applications.	Specific
Effectively applies the criteria for cable selection and connectors used in structured wiring.	Specific
Rightly identifies codes and regulations for design and installation of structured wiring.	Specific
Correctly recognizes the importance of applying correspondent codes and regulations.	Specific
Correctly distinguishes the technical requirements defining codes and regulations.	Specific
Rightly applies the codes and regulations to solve cases related to design and installation of wiring systems.	Specific
Correctly recognizes criteria for designing the wiring system.	Specific
Adequately describes the method to execute calculations and budgets.	Specific
Rightly applies techniques for cables construction.	Specific
Effectively applies techniques and methods to detect and correct failures in the wiring system	Specific

Competency Elements

Reference	Title of the element
2 – 4	Design and implementation of structured wiring systems

Performance criteria:
1. Identifies basic concepts associated with structured wiring.
2. Identifies the different kinds of cables and connectors, their characteristics and applications.
3. Applies the technical norms in the construction and replacement of wiring.
4. Recognizes the fundamental principles in codes and regulations related to structured wiring.

Application Field:

Category	Class
Services	Provision of Technical Education Services

Performance Evidence:
1. Recognizes technical characteristics in structured wiring.
2. Characterizes structured wiring systems.
3. Recognizes their characteristics.
4. Explains their uses and applications.
5. Distinguishes the technical requirements defining codes and regulations.
6. Describes the method to execute calculations and budgets.

Product Evidence:

1. Applies the criteria for cable selection and connectors used in structured wiring.
2. Applies the codes and regulations to solve cases related to design and installation of wiring systems.
3. Applies techniques for cables construction.
4. Applies techniques and methods to detect and correct failures in the wiring system.

Knowledge Evidence:

1. Mentions concepts associated with structured wiring.
2. Identifies functions structured wiring in the installation of systems.
3. Mentions basic concepts associated with cables and connectors in structured wiring.
4. Identifies codes and regulations for design and installation of structured wiring.
5. Recognizes the importance of applying correspondent codes and regulations.
6. Recognizes criteria for designing the wiring system.

Sector: Commercial and Services	Program: Computer Networking

Subject area: Computer Network	Grade: Eleventh

Study block: Structured Wiring	Time: 126 hours

Purpose: Design and implement structured wiring systems.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Identify basic concepts associated with structured wiring	• Structured wiring: • Concepts • Characteristics • Functions • Applications	Teacher: • Defines concepts associated with structured wiring. • Describes technical characteristics that represent structured wiring. • Explains functions of structured wiring in the installation of systems. • Exemplifies systems of structured wiring.	• Effort to achieve a given goal with one's personal determination or the assistance of others.	• Identifies basic concepts associated with structured wiring.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Mentions concepts associated with structured wiring. • Recognizes technical characteristics in structured wiring. • Identifies functions of structured wiring in the installation of systems. • Characterizes structured wiring systems.		

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

2. Identify different kinds of cables and connectors, their characteristics, and applications.	• Cables:
	  • Concept
	  • Characteristics
	  • Criteria for the selection according to use
	  • Types:
	    • Coaxial
	    • UTP – braided pair
	    • Optic fiber
	  • Categories
	• Connectors:
	  • Concept
	  • Characteristics
	  • Types
	  • Use
		Teacher:
		• Defines concepts associated with cables and connectors used in structured wiring.
		• Identifies characteristics of cables and connectors used in structured wiring.
		• Describes uses and applications of cables and connectors in networks.
		• Explains technical criteria behind the selection of cables and connectors used in structured wiring.
			• Effort to achieve given goal with one's personal determination or the assistance of others.	• Identifies the different kinds of cables and connectors, their characteristics, and, applications.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Mentions basic concepts associated with cables and connectors in structured wiring. • Recognizes their characteristics. • Explains their uses and applications. • Applies the criteria for cable selection and connectors used in structured wiring.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
3. Recognize fundamental principles in codes and regulations related to structured wiring.	• Structured wiring codes and regulations • Characteristics • Importance • Advantages of its application • Technical requirements • Updated Regulations and Codes	Teacher: • Describes codes and regulations applicable to design and installation of structured wiring. • Relates the importance of the application of codes and regulations. • Illustrates technical requirements defining the different codes and regulations. • Illustrates application method of codes and regulations in designing and installing wiring systems.	• Effort to achieve a given goal with individual determination or the assistance of others	• Recognizes the fundamental principles in codes and regulations related to structured wiring.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies codes and regulations for design and installation of structured wiring. • Recognizes the importance of applying correspondent codes and regulations. • Distinguishes the technical requirements defining codes and regulations. • Applies the codes and regulations to solve cases related to design and installation of wiring systems.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
4. Apply technical norms in the construction and replacement of wiring systems.	• Design of wiring system: • Revision of plant and distribution of the shop • Equipment • Quantity • Characteristics • Type of server • Available software • Identification of transit zones and security Number of users • Materials and budgets calculation: • Materials • Tools • Components	Teacher: • Describes the criteria to design a wiring system. • Explains the method for executing calculations and budgets. • Exemplifies the techniques for wiring construction. • Represents the techniques and methods for detection and correction of failures in the wiring system.	• Effort to achieve individual determination or the assistance of others.	• Applies technical norms in the construction and replacement of wiring.

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

	• Assembly of structures to protect the cables:
	   • Selection criteria
	   • Materials:
	     • Conduits
	     • Tubes
	   • Tools
	 • System components:
	   • Cable protection
	   • Connectors
	   • Curves
	   • "T"
	   • Cables
	   • Others
	 • Construction of cables:
	   • Tools
	   • Connectors
	   • Types of cables:
	     • Coaxial
	     • UTP
	     • Color coded
	     • Others
	 • Tests and failure corrections
		Student:
		 • Recognizes criteria for designing the wiring system.
		 • Describes the method to execute calculations and budgets.
		 • Applies techniques for cables construction.
		 • Applies techniques and methods to detect and correct failures in the wiring system.		

PRACTICE AND CHECKLISTS

PRACTICE DEVELOPMENT

STUDY BLOCK: Structured wiring	PRACTICE No. 1

PURPOSE:

Scenario: Classroom	TIME:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:

- Defines concepts associated with structured wiring.
- Describes technical characteristics that represent structured wiring.
- Explains functions of structured wiring in the installation of systems.
- Exemplifies systems of structured wiring.
- Defines concepts associated with cables and connectors used in structured wiring.
- Identifies characteristics of cables and connectors used in structured wiring.
- Describes uses and applications of cables and connectors in networks.
- Explains technical criteria behind the selection of cables and connectors used in structured wiring.
- Describes codes and regulations applicable to design and installation of structured wiring.
- Relates the importance of the application of codes and regulations.
- Illustrates technical requirements defining the different codes and regulations.
- Illustrates application method of codes and regulations in designing and installing wiring systems.
- Describes the criteria to design a wiring system.
- Explains the method for executing calculations and budgets.
- Exemplifies the techniques for wiring construction.
- Represents the techniques and methods for detection and correction of failures in the wiring system.

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 mentions concepts associated with structured wiring.			
Effectively recognizes technical characteristics in structured wiring.			
Accurately identifies functions structured wiring in the installation of systems.			
Effectively characterizes structured wiring systems.			
Rightly mentions basic concepts associated with cables and connectors in structured wiring.			
Correctly recognizes their characteristics.			
Adequately explains their uses and applications.			
Effectively applies the criteria for cable selection and connectors used in structured wiring.			
Rightly identifies codes and regulations for design and installation of structured wiring.			
Correctly recognizes the importance of applying correspondent codes and regulations.			
Correctly distinguishes the technical requirements defining codes and regulations.			
Rightly applies the codes and regulations to solve cases related to design and installation of wiring systems.			
Correctly recognizes criteria for designing the wiring system.			
Adequately describes the method to execute calculations and budgets.			
Rightly applies techniques for cables construction.			
Effectively applies techniques and methods to detect and correct failures in the wiring system			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify basic concepts associated with structured wiring.	Identifies basic concepts associated with structured wiring.	Mentions concepts associated with structured wiring.	Knowledge	Correctly mentions concepts associated with structured wiring.
		Recognizes technical characteristics in structured wiring.	Performance	Effectively recognizes technical characteristics in structured wiring.
		Identifies functions structured wiring in the installation of systems.	Knowledge	Accurately identifies functions structured wiring in the installation of systems.
		Characterizes structured wiring systems.	Performance	Effectively characterizes structured wiring systems.
Identify different kinds of cables and connectors, their characteristics and applications.	Identifies the different kinds of cables and connectors, their characteristics and applications.	Mentions basic concepts associated with cables and connectors in structured wiring.	Knowledge	Rightly mentions basic concepts associated with cables and connectors in structured wiring.
		Recognizes their characteristics.	Performance	Correctly recognizes their characteristics.
		Explains their uses and applications.	Performance	Adequately explains their uses and applications.
		Applies the criteria for cable selection and connectors used in structured wiring.	Product	Effectively applies the criteria for cable selection and connectors used in structured wiring.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Recognizes fundamental principles in codes and regulations related to structured wiring.	Recognizes the fundamental principles in codes and regulations related to structured wiring.	Identifies codes and regulations for design and installation of structured wiring.	Knowledge	Rightly identifies codes and regulations for design and installation of structured wiring.
		Recognizes the importance of applying correspondent codes and regulations.	Knowledge	Correctly recognizes the importance of applying correspondent codes and regulations.
		Distinguishes the technical requirements defining codes and regulations.	Performance	Correctly distinguishes the technical requirements defining codes and regulations.
		Applies the codes and regulations to solve cases related to design and installation of wiring systems.	Product	Rightly applies the codes and regulations to solve cases related to design and installation of wiring systems.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Apply technical norms in the construction and replacement of wiring systems.	Applies technical norms in the construction and replacement of wiring systems.	Recognizes criteria for designing the wiring system.	Knowledge	Correctly recognizes criteria for designing the wiring system.
		Describes the method to execute calculations and budgets.	Performance	Adequately describes the method to execute calculations and budgets.
		Applies techniques for cables construction.	Product	Rightly applies techniques for cables construction.
		Applies techniques and methods to detect and correct failures in the wiring system.	Product	Effectively applies techniques and methods to detect and correct failures in the wiring system.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA
Title: Physical Network Installation
Purpose: Installation, configuration and expansion of small networks.
Competency Level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

TITLE	Classification
Effectively identifies basic concepts related to network construction.	Specific
Accurately describes characteristics of each element.	Specific
Rightly explains the operation of network technologies.	Specific
Accurately defines basic concepts related to installation and configuration of equipment in networks.	Specific
Effectively identifies characteristics of equipment components.	Specific
Correctly distinguishes devices with "plug and play" technology.	Specific
Accurately installs and completes the configuration of different devices.	Specific
Effectively identifies basic concepts related to network cards and wiring.	Specific
Accurately recognizes their characteristics of cards and wiring.	Specific
Accurately installation and configuration of network cards.	Specific
Effectively constructs types of the network wiring.	Specific
Effectively identifies terms related to network installation, configuration, and expansion.	Specific
Rightly recognizes procedures.	Specific
Accurately installs and completes configuration of a small network.	Specific
Rightly expands the previously constructed network.	Specific
Accurately comments on the importance of internships in a company.	Specific
Effectively mentions the philosophy involving internships.	Specific
Rightly prepares a report of experiences in the company.	Specific
Arranges an internship with a neighborhood company organized by technical coordinators, the company and the principal.	Specific

Competency Elements

Reference	Title of the element
2 – 5	Installation, configuration and expansion of small networks.

Performance criteria:
1. Distinguishes basic concepts related to building a computer network.
2. Installs and configures peripheral equipment in terminals and networks.
3. Installs and configures types of network cards or wiring used in network building.
4. Applies installation concepts, configuration, and expansion of a network.
5. Applies acquired knowledge, skills, and abilities regarding networking in an internship.

Application Field:

Category	Class
Services	Provision of Technical Education Services.

Performance Evidence:
1. Describes the characteristics of each element.
2. Explains the operation of different technologies.
3. Identifies characteristics of equipment components.
4. Distinguishes devices with "plug and play" technology.
5. Recognizes their characteristics of cards and wiring.
6. Recognizes procedures.
7. Comments on the importance of internships in a company.
8. Mentions the philosophy involving internships.

Product Evidence:

1. Installs and completes the configuration of different devices.
2. Installation and configuration of network cards.
3. Constructs types of the network wiring.

4. Installs and completes configuration of a small network.
5. Expands the previously constructed network.
6. Prepares a report of experiences in the company.
7. Arranges an internship with a neighborhood company organized by technical coordinators, the company and the principal.

Knowledge Evidence:

1. Identifies basic concepts related to network construction.
2. Defines basic concepts related to installation and configuration of equipment in networks.
3. Identifies basic concepts related to network cards and wiring.
4. Identifies terms related to network installation, configuration, and expansion.

Sector: Commercial and Services	Program: Computer Networking
Subject Area: Computer Networks	Grade: Eleventh
Study block: Physical Network Installation	Time: 252 hours
Purpose: Installation, configuration, and expansion of small networks	

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Distinguish basic concepts related to building a computer network.	• Basic concepts: • Server, station • Dedicated non-dedicated server • Shared and distributed processing • Technology client /server • Internet servers • Electronic mail	Teacher: • Describes characteristics of each element. • Illustrates the operation of technologies. • Exemplifies the operation of network connection technologies.	• Exhibit transparency in relationships with others.	• Distinguishes basic concepts related to building a computer network.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies basic concepts related to network construction. • Describes characteristics of each element. • Explains the operation of network technologies.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Install and configure peripheral equipment in terminals and network.	• Controlling device cards: • Jumpers Configuration • Identification by means of physical characteristics • Manufacturer´s information • IRQs channels • Device managers • Installable device managers: • Plug and Play technology • Main peripherals: • Mouse • Keyboard • Ports I/0 • Printer • Monitor • Disk units	Teacher: • Defines basic concepts related to installation and configuration of equipment in networks. • Identifies characteristics of components and software managers of peripheral devices. • Describes "Plug and Play" technology and peripheral devices. • Installs and completes the configuration of peripheral devices.	• Exhibits transparency in relationships with others.	• Installs and configures peripheral equipment in terminals and networks.

LEARNING RESULTS	CONTENTS	TEACHING LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Defines basic concepts related to installation and configuration of equipment in networks. • Identifies characteristics of equipment components. • Distinguishes devices with "Plug and Play" technology. • Installs and completes the configuration of different devices.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
3. Install and configure types of network cards or wiring used in network building.	• Physical devices : • Network Interface Card (NIC) • ISA/PCI • Connectors • BNC/ cable coaxial 10 base T • RJ- 45 • Speed transmission of cards in operating network systems • Physical installation according to topology • 10 base 2 • 10 base 5 • 10 base T • Concentrator	Teacher: • Defines basic concepts related to network cards and cables. • Describes their characteristics. • Installs and completes the configuration of network cards. • Constructs different types of network cables.	• Exhibit transparency in relationship with others.	• Installs and configures types of network cards or wiring used in network building.

LEARNING RESULTS	CONTENTS	TEACHING LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies basic concepts related to network cards and wiring. • Recognizes their characteristics of cards and wiring. • Installation and configuration of network cards. • Constructs types of the network wiring.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
4. Apply installation concepts, configuration, and expansion of a network.	• Installation CHECKLIST • Physical equipment • Installation • Access user programs • Expansion of a network: • Repeaters • Bridges • Routers • Cubes • Protocol gateways • Backbone	Teacher: • Defines and interprets terms related to network installation, configuration, and expansion. • Describes the procedure. • Installs and completes network configuration. • Demonstrates the expansion process of a previously constructed network.	• Exhibits Transparency in one's relationship with others.	• Applies installation concepts, configuration, and expansion of a network.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies terms related to network installation, configuration, and expansion. • Recognizes procedures. • Installs and completes configuration of a small network. • Expands the previously constructed network.		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
5. Apply acquired knowledge, skills, and abilities regarding networking in an internship.	• Internships	Teacher: • Explains the importance of internships in a company. • Indicates the philosophy of internships. • Describes experiences inherent in each task to be completed in a company. • Plans an internship in neighborhood companies organized by technical coordinators, the company, and the principal.	• Exhibit transparency in relationships	• Applies acquired knowledge, skills, and abilities regarding networking in an internship.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Comments on the importance of internships in a company. • Mentions the philosophy involving internships. • Prepares a report of experiences in the company. • Arranges an internship with a neighborhood company organized by technical coordinators, the company and the principal.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

STUDY BLOCK: Network Physical Installation	PRACTICE No. 1

Purpose:

Scenario: Classroom	TIME:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures
Teacher: • Describes characteristics of each element. • Illustrates the operation of technologies. • Exemplifies the operation of network connection technologies. • Defines basic concepts related to installation and configuration of equipment in networks. • Identifies characteristics of components and software managers of peripheral devices. • Describes "Plug and Play" technology and peripheral devices. • Installs and completes the configuration of peripheral devices. • Defines basic concepts related to network cards and cables. • Describes their characteristics. • Installs and completes the configuration of network cards. • Constructs different types of network cables. • Defines and interprets terms related to network installation, configuration, and expansion. • Describes the procedure. • Installs and completes network configuration. • Demonstrates the expansion process of a previously constructed network.

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 identifies basic concepts related to network construction.			
Accurately describes characteristics of each element.			
Rightly explains the operation of network technologies.			
Accurately defines basic concepts related to installation and configuration of equipment in networks.			
Effectively identifies characteristics of equipment components.			
Correctly distinguishes devices with "plug and play" technology.			
Accurately installs and completes the configuration of different devices.			
Effectively identifies basic concepts related to network cards and wiring.			
Accurately recognizes the characteristics of cards and wiring.			
Accurately installation and configuration of network cards.			
Effectively constructs types of the network wiring.			
Effectively identifies terms related to network installation, configuration, and expansion.			
Rightly recognizes procedures.			
Accurately installs and completes configuration of a small network.			
Rightly expands the previously constructed network.			
Accurately comments on the importance of internships in a company.			
Effectively mentions the philosophy involving internships.			

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Rightly prepares a report of experiences in the company.			
Arranges an internship with a neighborhood company organized by technical coordinators, the company and the principal.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Distinguish basic concepts related to building a computer network.	Distinguishes basic concepts related to building a computer network.	Identifies basic concepts related to network construction.	Knowledge	Effectively identifies basic concepts related to network construction.
		Describes the characteristics of each element.	Performance	Accurately describes characteristics of each element.
		Explains the operation of different technologies.	Performance	Rightly explains the operation of network technologies.
Install and configure peripheral equipment in terminals and networks.	Installs and configures peripheral equipment in terminals and networks.	Defines basic concepts related to installation and configuration of equipment in networks.	Knowledge	Accurately defines basic concepts related to installation and configuration of equipment in networks.
		Identifies characteristics of equipment components.	Performance	Effectively identifies characteristics of equipment components.
		Distinguishes devices with "plug and play" technology.	Performance	Correctly distinguishes devices with "plug and play" technology.
		Installs and completes the configuration of different devices.	Product	Accurately installs and completes the configuration of different devices.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Install and configure types of network cards or wiring used in network building.	Installs Install and configure types of network cards or wiring used in network building.	Identifies basic concepts related to network cards and wiring.	Knowledge	Effectively identifies basic concepts related to network cards and wiring.
		Recognizes their characteristics of cards and wiring.	Performance	Accurately recognizes the characteristics of cards and wiring.
		Installation and configuration of network cards.	Product	Accurately installation and configuration of network cards.
		Constructs types of the network wiring.	Product	Effectively constructs types of the network wiring.
Apply network installation, configuration and expansion concepts.	Applies the installation, configuration and expansion network concepts.	Identifies terms related to network installation, configuration, and expansion.	Knowledge	Effectively identifies terms related to network installation, configuration, and expansion.
		Recognizes procedures.	Performance	Rightly recognizes procedures.
		Installs and completes configuration of a small network.	Product	Accurately installs and completes configuration of a small network.
		Expands the previously constructed network.	Product	Rightly expands the previously constructed network.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Apply acquired knowledge, skills, and abilities regarding networking in an internship.	Applies acquired knowledge, skills, and abilities regarding networking in an internship.	Comments on the importance of internships in a company.	Performance	Accurately comments on the importance of internships in a company.
		Mentions the philosophy involving internships.	Performance	Effectively mentions the philosophy involving internships.
		Prepares a report of experiences in the company.	Product	Rightly prepares a report of experiences in the company.
		Arranges an internship with a neighborhood company organized by technical coordinators, the company and the principal.	Product	Arranges an internship with a neighborhood company organized by technical coordinators, the company and the principal.

SUB – ÁREA: MANIPULACIÓN DE

LA INFORMACIÓN

SUB – ÁREA: MANIPULACIÓN DE LA INFORMACIÓN

DESCRIPCIÓN

Un Técnico en el Nivel Medio en Informática en Redes de Computadoras, debe conocer los elementos fundamentales relacionados con el uso y manejo de la información; particularmente, de los sistemas de bases de datos. Es necesario no solo que desarrollen las habilidades y destrezas para diseñar, crear y mantener pequeñas bases de datos, sino también que desarrollen aquellos conocimientos básicos que les permitan comprender el manejo y operación de éstas, de modo que puedan implementar las estrategias básicas para migrar los datos, los sistemas y otros elementos asociados con éxito. En esta sub – área se presentan las siguientes unidades de estudio:

- Bases de datos: integra los conceptos fundamentales para el diseño, creación y mantenimiento de bases de datos.
- Introducción a la programación en ambiente visual: describe las funciones y herramientas básicas disponibles en el ambiente de programación de un lenguaje de programación específico.
- Gestión Empresarial: Esta subarea se desarrolla en el estudiante los conocimientos, habilidades y destrezas necesarias para convivencia efectiva en el entorno del sector productivo nacional.

OBJETIVOS GENERALES
SUB – ÁREA: MANIPULACIÓN DE LA INFORMACIÓN

Desarrollar en el estudiante los conocimientos, habilidades y destrezas básicos para:

- La creación y mantenimiento de bases de datos

- El diseño de programas utilizando las herramientas y estructuras disponibles en un lenguaje de ambiente visual.

- La convivencia efectiva en el entorno del sector productivo nacional.

DISTRIBUCIÓN DE LAS UNIDADES DE ESTUDIO

MANIPULACIÓN DE LA INFORMACIÓN

Unidades	Nombre	Tiempo Estimado en horas	Tiempo estimado en semanas
I.	Bases de Datos	40	10
II.	Introducción a la Programación en Ambiente Visual	60	15
III.	Gestión Empresarial	60	15
	TOTAL	160	40

NORMA TÉCNICA DE INSTITUCIÓN EDUCATIVA

DATOS GENERALES

Titulo: Bases de Datos
Propósito: Creación y mantenimiento de bases de datos.
Nivel de competencia: Básica

UNIDADES DE COMPETENCIA LABORAL QUE CONFORMAN LA NORMA

Título	Clasificación
Define los conceptos básicos referentes a los datos con eficiencia.	Específica
Diferencia eficientemente los tipos y fuentes de datos.	Específica
Determina correctamente el valor de diferentes datos de acuerdo con las normas dadas.	Específica
Caracteriza con precisión los diferentes sistemas para el manejo de datos.	Específica
Define con eficiencia los conceptos básicos relacionados con las bases de datos.	Específica
Reconoce correctamente las utilidades y ventajas de las bases de datos.	Específica
Explica con claridad los modelos entidad – relación y relacional.	Específica
Diferencia las características de una base de datos relacional con eficiencia.	Específica
Examina adecuadamente diferentes bases de datos para identificar los diferentes elementos estudiados.	Específica
Desarrolla bases de datos sin margen de error.	Específica
Distingue con claridad los conceptos básicos relacionados con el entorno.	Específica
Interpreta adecuadamente los aspectos relacionados con la seguridad.	Específica
Aplica con exactitud las acciones necesarias para la planificación del mantenimiento.	Específica
Realiza con eficiencia diferentes operaciones sobre bases de datos utilizando las herramientas.	Específica
Aplica sin margen de error, las diferentes operaciones sobre tablas en bases de datos desarrolladas.	Específica
Identifica de forma correcta el concepto y características de los índices, relaciones, control de restricciones y objetos de tabla.	Específica

Título	Clasificación
Describe adecuadamente los procedimientos para el manejo de los diferentes elementos.	Específica
Utiliza los índices, relaciones, control de restricciones y objetos de tabla con eficiencia.	Específica
Diseña diagramas para el mantenimiento de las bases de datos con eficiencia.	Específica
Crea y da mantenimiento a bases de datos con eficiencia.	Específica

Elementos de competencia

Referencia	Título del elemento
3 - 1	Creación y mantenimiento de bases de datos.

Criterios de desempeño:

1. Identifica los elementos fundamentales asociados con las bases de datos.
2. Describe las características de los diferentes modelos de bases de datos y el proceso de normalización.
3. Aplica elementos relacionados con el manejo de información para la construcción y mantenimiento de bases de datos.
4. Utiliza las funciones y herramientas disponibles para la creación o manejo de bases de datos.

Campo de aplicación:

Categoría	Clase
Servicios	Prestación de servicios de Educación Técnica

Evidencias de desempeño:

1. Diferencia los tipos y fuentes de datos.
2. Determina el valor de diferentes datos de acuerdo con las normas dadas.
3. Caracteriza los diferentes sistemas para el manejo de datos.
4. Examina diferentes bases de datos para identificar los diferentes elementos estudiados.
5. Realiza diferentes operaciones sobre bases de datos utilizando las herramientas.

6. Describe los procedimientos para el manejo de los diferentes elementos.
7. Utiliza los índices, relaciones, control de restricciones y objetos de tabla.

Evidencias de conocimiento:

1. Define los conceptos básicos referentes a los datos.
2. Define los conceptos básicos relacionados con las bases de datos.
3. Reconoce las utilidades y ventajas de las bases de datos.
4. Distingue los conceptos básicos relacionados con el entorno.
5. Identifica el concepto y características de los índices, relaciones, control de restricciones y objetos de tabla.

Evidencias de producto:

1. Desarrolla bases de datos.
2. Interpreta los aspectos relacionados con la seguridad.
3. Aplica las acciones necesarias para la planificación del mantenimiento.
4. Crea y da mantenimiento a bases de datos.

Modalidad: Comercial y Servicios	Especialidad: Computer Networking
Sub-área: Manipulación de la Información	Año: Undécimo
Unidad de Estudio: Bases de Datos	Tiempo Estimado: 40 horas
Propósito: Creación y mantenimiento de bases de datos.	

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
1. Identificar los elementos fundamentales asociados con las bases de datos.	• Datos: • Conceptos: • Datos • Registros • Archivo • Campo. • Fuentes de datos • Tipos de datos • Atributos • Valor de los datos • Sistemas de manejo de datos.	El o la docente: • Define los conceptos básicos referentes a los datos. • Identifica las fuentes y tipos de datos. • Examina el valor de los datos de acuerdo con los criterios técnicos. • Caracteriza los diferentes sistemas para el manejo de datos.	• Comportarse de manera transparente con sus semejantes.	• Identifica los elementos fundamentales asociados con las bases de datos.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante : • Define los conceptos básicos referentes a los datos. • Diferencia los tipos y fuentes de datos. • Determina el valor de diferentes. datos de acuerdo con las normas dadas. • Caracteriza los diferentes sistemas para el manejo de datos.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA – APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

2. Describir las características de los diferentes modelos de bases de datos y el proceso de normalización.	• Bases de datos:
	• Objetivos de los sistemas de bases de datos
	• Administrador de bases de datos
	• Modelo entidad – relación:
	• Modelo relacional:
	  • Relaciones, dominios, atributos y tuplas
	  • Dependencia funcional
	  • Llaves:
	    • Primaria
	    • Candidata
	    • Alterna
	    • Externa.
		El o la docente:
		• Define los conceptos básicos relacionados con las bases de datos.
		• Ejemplifica la normalización de las bases de datos.
		• Aplica las tres primeras formas de normalización en casos específicos.
		• Elabora ejemplos de bases de datos desarrolladas.
			• Comportarse de manera transparente con sus semejantes.	Describe las características de los diferentes modelos de bases de datos y el proceso de normalización.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

	• Normalización:
	  • Aplicaciones
	  • Las tres primeras formas de normalización.
		El o la estudiante :
		• Define los conceptos básicos relacionados con las bases de datos.
		• Reconoce las utilidades y ventajas de las bases de datos.
		• Examina diferentes bases de datos para identificar los diferentes elementos estudiados.
		• Desarrolla bases de datos.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
3. Aplicar elementos relacionados con el manejo de información para la construcción y mantenimiento de bases de datos.	• Entorno de trabajo: • Administrador corporativo • Registro, arranque y levantado del servidor. • Bases de datos: • Conexión • Objetos • Salida. • Seguridad: • Copias de seguridad • Restauración de bases de datos • Asistente de planificación de mantenimiento • Niveles de seguridad.	El o la docente: • Define los conceptos básicos relacionados con el lenguaje y el entorno. • Describe los elementos que conforman la seguridad. • Ejemplifica el uso del asistente para la planificación del mantenimiento. • Describe el procedimiento para la creación, administración y borrado de bases de datos.	• Comportarse de manera transparente con sus semejantes.	• Aplica elementos relacionados con el manejo de información para la construcción y mantenimiento de bases de datos.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

	• Bases de datos:
	  • Creación, modificación, administración y borrado
	  • Tablas:
	    • Creación
	    • Modificación
	    • Inserción de filas y columnas
	  • Índices:
	    • Creación, modificación y borrado.
	  • Relaciones:
	    • Creación y modificación
	    • Mantener relaciones.
	  • Control de restricciones.
		El o la estudiante :
		• Distingue los conceptos básicos relacionados con el entorno.
		• Interpreta los aspectos relacionados con la seguridad.
		• Aplica las acciones necesarias para la planificación del mantenimiento.
		• Realiza diferentes operaciones sobre bases de datos utilizando las herramientas.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

4. Utilizar las funciones y herramientas disponibles para la creación o manejo de bases de datos.	• Objetos de tabla:
	  • Propiedades predeterminadas
	  • Reglas
	  • Tipos de datos definidos por el usuario.
	• Diagramas:
	  • Creación
	  • Mantenimiento de la base de datos
	  • Cambio del esquema de la base de datos
	  • Creación de objetos.
		El o la docente:
		• Define los conceptos relacionados con índices, relaciones, control de restricciones y objetos de tabla.
		• Identifica las características de cada uno de estos elementos.
		• Ejemplifica el uso de estos elementos en la creación y mantenimiento de bases de datos.
		• Crea y da mantenimiento de bases de datos.
			• Comportarse de manera transparente con sus semejantes.	• Utiliza las funciones y herramientas disponibles para la creación o manejo de bases de datos.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante : • Identifica el concepto y características de los índices, relaciones, control de restricciones y objetos de tabla. • Describe los procedimientos para el manejo de los diferentes elementos. • Utiliza los índices, relaciones, control de restricciones y objetos de tabla. • Crea y da mantenimiento a bases de datos.		

PRACTICAS Y LISTAS DE COTEJO

DESARROLLO DE LA PRACTICA

UNIDAD DE ESTUDIO: Bases de Datos	PRÀCTICA No. 1

Propósito:

Escenario: Aula	Duración:

MATERIALES	MAQUINARIA	EQUIPO	HERRAMIENTA

Procedimientos

El o la docente:

- Define los conceptos básicos referentes a los datos.
- Identifica las fuentes y tipos de datos.
- Examina el valor de los datos de acuerdo con los criterios técnicos.
- Caracteriza los diferentes sistemas para el manejo de datos.
- Define los conceptos básicos relacionados con las bases de datos.
- Ejemplifica la normalización de las bases de datos.
- Aplica las tres primeras formas de normalización en casos específicos.
- Elabora ejemplos de bases de datos desarrolladas.
- Define   los conceptos básicos relacionados con el lenguaje y el entorno.
- Describe los elementos que conforman la seguridad.
- Ejemplifica el uso del asistente para la planificación del mantenimiento.
- Describe el procedimiento para la creación, administración y borrado de bases de datos.
- Define los conceptos relacionados con índices, relaciones, control de restricciones y objetos de tabla.
- Identifica las características de cada uno de estos elementos.
- Ejemplifica el uso de estos elementos en la creación y mantenimiento de bases de datos.
- Crea y da mantenimiento de bases de datos.

LISTA DE COTEJO SUGERIDA	Fecha:

Nombre del o la estudiante:	

Instrucciones:
- A continuación se presentan los criterios que van a ser verificados en el desempeño del o la estudiante mediante la observación del mismo. De la siguiente lista marque con una "X" aquellas observaciones que hayan sido cumplidas por el o la estudiante durante su desempeño.

DESARROLLO	SI	AUN NO	NO APLICA
Define los conceptos básicos referentes a los datos con eficiencia.			
Diferencia eficientemente los tipos y fuentes de datos.			
Determina correctamente el valor de diferentes datos de acuerdo con las normas dadas.			
Caracteriza con precisión los diferentes sistemas para el manejo de datos.			
Define con eficiencia los conceptos básicos relacionados con las bases de datos.			
Reconoce correctamente las utilidades y ventajas de las bases de datos.			
Examina adecuadamente diferentes bases de datos para identificar los diferentes elementos estudiados.			
Desarrolla bases de datos sin margen de error.			
Distingue con claridad los conceptos básicos relacionados con el entorno.			
Interpreta adecuadamente los aspectos relacionados con la seguridad.			
Aplica con exactitud las acciones necesarias para la planificación del mantenimiento.			
Realiza con eficiencia diferentes operaciones sobre bases de datos utilizando las herramientas.			
Identifica de forma correcta el concepto y características de los índices, relaciones, control de restricciones y objetos de tabla.			
Describe adecuadamente los procedimientos para el manejo de los diferentes elementos.			
Utiliza los índices, relaciones, control de restricciones y objetos de tabla con eficiencia.			
Crea y da mantenimiento a bases de datos con eficiencia.			

OBSERVACIONES:

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Identificar los elementos fundamentales asociados con las bases de datos.	Identifica los elementos fundamentales asociados con las bases de datos.	Define los conceptos básicos referentes a los datos.	Conocimiento	Define los conceptos básicos referentes a los datos con eficiencia.
		Diferencia los tipos y fuentes de datos.	Desempeño	Diferencia eficientemente los tipos y fuentes de datos.
		Determina el valor de diferentes datos de acuerdo con las normas dadas.	Desempeño	Determina correctamente el valor de diferentes datos de acuerdo con las normas dadas.
		Caracteriza los diferentes sistemas para el manejo de datos.	Desempeño	Caracteriza con precisión los diferentes sistemas para el manejo de datos.
Describir las características de los diferentes modelos de bases de datos y el proceso de normalización.	Describe las características de los diferentes modelos de bases de datos y el proceso de normalización.	Define los conceptos básicos relacionados con las bases de datos.	Conocimiento	Define con eficiencia los conceptos básicos relacionados con las bases de datos.
		Reconoce las utilidades y ventajas de las bases de datos.	Conocimiento	Reconoce correctamente las utilidades y ventajas de las bases de datos.
		Examina diferentes bases de datos para identificar los diferentes elementos estudiados.	Desempeño	Examina adecuadamente diferentes bases de datos para identificar los diferentes elementos estudiados.
		Desarrolla bases de datos.	Producto	Desarrolla bases de datos sin margen de error.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Aplicar elementos relacionados con el manejo de información para la construcción y mantenimiento de bases de datos.	Aplica elementos relacionados con el manejo de información para la construcción y mantenimiento de bases de datos.	Distingue los conceptos básicos relacionados con el entorno.	Conocimiento	Distingue con claridad los conceptos básicos relacionados con el entorno.
		Interpreta los aspectos relacionados con la seguridad.	Producto	Interpreta adecuadamente los aspectos relacionados con la seguridad.
		Aplica las acciones necesarias para la planificación del mantenimiento.	Producto	Aplica con exactitud las acciones necesarias para la planificación del mantenimiento.
		Realiza diferentes operaciones sobre bases de datos utilizando las herramientas.	Desempeño	Realiza con eficiencia diferentes operaciones sobre bases de datos utilizando las herramientas.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Utilizar las funciones y herramientas disponibles para la creación o manejo de bases de datos.	Utiliza las funciones y herramientas disponibles para la creación o manejo de bases de datos.	Identifica el concepto y características de los índices, relaciones, control de restricciones y objetos de tabla.	Conocimiento	Identifica de forma correcta el concepto y características de los índices, relaciones, control de restricciones y objetos de tabla.
		Describe los procedimientos para el manejo de los diferentes elementos.	Desempeño	Describe adecuadamente los procedimientos para el manejo de los diferentes elementos.
		Utiliza los índices, relaciones, control de restricciones y objetos de tabla.	Desempeño	Utiliza los índices, relaciones, control de restricciones y objetos de tabla con eficiencia.
		Crea y da mantenimiento a bases de datos.	Producto	Crea y da mantenimiento a bases de datos con eficiencia.

NORMA TÉCNICA DE INSTITUCIÓN EDUCATIVA

DATOS GENERALES

Titulo: Introducción a la Programación en Ambiente Visual
Propósito: Diseño de programas utilizando las herramientas y estructuras disponibles en un lenguaje de ambiente visual.
Nivel de competencia: Básica

UNIDADES DE COMPETENCIA LABORAL QUE CONFORMAN LA NORMA

Título	Clasificación
Identifica correctamente los conceptos básicos relacionados con el entorno de trabajo.	Específica
Reconoce con precisión las características, usos, utilidades y manejo de las herramientas disponibles.	Específica
Selecciona adecuadamente diferentes menús y opciones.	Específica
Utiliza eficientemente los accesos y funciones del entorno de trabajo.	Específica
Identifica correctamente los elementos que componen un programa en un lenguaje de ambiente visual.	Específica
Reconoce con precisión el uso y aplicaciones de los diferentes elementos que componen la estructura del programa.	Específica
Sigue de forma correcta la sintaxis y normas para la declaración y manejo de los diferentes elementos.	Específica
Utiliza eficientemente cada uno de los elementos que componen la estructura del programa.	Específica
Desarrolla programas en un lenguaje de ambiente visual utilizando los diferentes elementos que definen su estructura.	Específica
Identifica adecuadamente las sentencias de control.	Específica
Sigue de forma correcta la sintaxis y normas para la declaración y manejo de las sentencias.	Específica
Selecciona adecuadamente de acuerdo con uso y aplicaciones la sentencia adecuada.	Específica
Utiliza eficientemente cada uno de los tipos de sentencias en la solución de problemas.	Específica

Título	Clasificación
Desarrolla correctamente programas en un lenguaje de ambiente visual utilizando las diferentes sentencias.	Específica
Reconoce adecuadamente los procedimientos y funciones en el ámbito de un lenguaje de ambiente visual.	Específica
Aplica la sintaxis y normas para la declaración y manejo de procedimientos y funciones con eficiencia.	Específica
Selecciona adecuadamente entre las diferentes estructuras de acuerdo con el problema a resolver.	Específica
Diseña correctamente programas en un lenguaje de ambiente visual utilizando procedimientos y funciones.	Específica
Ejemplifica el uso del procedimiento, función, arreglos, registros y archivos para la solución de problemas específicos sin margen de error.	Específica
Elabora correctamente programas en un lenguaje de ambiente visual donde se utilizan estas estructuras.	Específica
Define con claridad las diferentes estructuras de control disponibles en un lenguaje de ambiente visual.	Específica
Reconoce con precisión las aplicaciones de cada una de estas estructuras.	Específica
Utiliza eficientemente la sintaxis y normas para la declaración de estos controles.	Específica
Soluciona diferentes problemas por medio del uso de los controles disponibles sin margen de error.	Específica
Aplica controles receptores de texto, de selección de opciones y controles comunes con eficiencia.	Específica
Diseña correctamente programas que utilicen los diferentes tipos de control disponibles.	Específica

Elementos de competencia

Referencia	Título del elemento
2 - 2	Diseñar programas utilizando las herramientas y estructuras disponibles en un lenguaje de ambiente visual.

Criterios de desempeño:

1. Utiliza las funciones y herramientas disponibles en el entorno de trabajo.
2. Utiliza las funciones y herramientas disponibles en un lenguaje de ambiente visual para el control del programa.
3. Desarrolla programas utilizando los elementos de programación modular en un lenguaje de ambiente visual.
4. Utiliza los diferentes comandos, instrucciones, funciones y controles disponibles para el desarrollo de programas.

Campo de aplicación:

Categoría	Clase
Servicios	Prestación de servicios de Educación Técnica

Evidencias de desempeño:

1. Selecciona diferentes menús y opciones.
2. Utiliza los accesos y funciones del entorno de trabajo.
3. Sigue la sintaxis y normas para la declaración y manejo de los diferentes elementos.
4. Selecciona de acuerdo con uso y aplicaciones la sentencia adecuada.
5. Aplica la sintaxis y normas para la declaración y manejo de procedimientos y funciones.
6. Selecciona entre las diferentes estructuras de acuerdo con el problema a resolver.
7. Ejemplifica el uso del procedimiento, función, arreglos, registros y archivos para la solución de problemas específicos.
8. Utiliza la sintaxis y normas para la declaración de estos controles.
9. Aplica controles receptores de texto, de selección de opciones y controles comunes.

Evidencias de producto:

1. Desarrolla programas en un lenguaje de ambiente visual utilizando los diferentes elementos que definen su estructura.
2. Desarrolla programas en un lenguaje de ambiente visual utilizando las diferentes sentencias.
3. Diseña programas en un lenguaje de ambiente visual utilizando procedimientos y funciones.
4. Elabora programas en un lenguaje de ambiente visual donde se utilizan estas estructuras.

5. Soluciona diferentes problemas por medio del uso de los controles disponibles.
6. Diseña programas que utilicen los diferentes tipos de control disponibles.

Evidencias de conocimiento:

1. Identifica los conceptos básicos relacionados con el entorno de trabajo.
2. Reconoce las características, usos, utilidades y manejo de las herramientas disponibles.
3. Identifica los elementos que componen un programa en un lenguaje de ambiente visual.
4. Reconoce el uso y aplicaciones de los diferentes elementos que componen la estructura del programa.
5. Identifica las sentencias de control.
6. Sigue la sintaxis y normas para la declaración y manejo de las sentencias.
7. Reconoce los procedimientos y funciones en el ámbito de un lenguaje de ambiente visual.
8. Define las diferentes estructuras de control disponibles en un lenguaje de ambiente visual.
9. Reconoce las aplicaciones de cada una de estas estructuras.

Modalidad: Comercial y Servicios		Especialidad: Computer Networking	
Sub-área: Manipulación de la Información		Año: Undécimo	
Unidad de Estudio: Introducción a la Programación en Ambiente Visual		Tiempo Estimado: 60 horas	

Propósito: Diseño de programas utilizando las herramientas y estructuras disponibles en un lenguaje de ambiente visual.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
1. Utilizar las funciones y herramientas disponibles en el entorno de trabajo.	• El entorno de trabajo: • Barra de títulos • Barra de menús • Barra de herramientas • Caja de herramientas • Ventana de formato inicial • Ventana de proyecto • Sistema de ayuda.	El o la docente: • Definición de conceptos básicos relacionados con el entorno de trabajo. • Explicación de características, usos, utilidades y manejo de las herramientas disponibles. • Observación del procedimiento de selección de menús y opciones. • Utilización de accesos y funciones del entorno de trabajo.	• Comportarse de manera transparente con sus semejantes.	• Utiliza las funciones y herramientas disponibles en el entorno de trabajo.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante : • Identifica los conceptos básicos relacionados con el entorno de trabajo. • Reconoce las características, usos, utilidades y manejo de las herramientas disponibles. • Selecciona diferentes menús y opciones. • Utiliza los accesos y funciones del entorno de trabajo.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
	• Elementos básicos de un programa en Visual: • Sentencias • Asignación y establecimiento de propiedades • Variables • Tipos de datos: • Enteros • Reales • Monetarios • De cadena • Lógicos • Para fechas • Para objetos • Variantes. • Constantes: • Literales • Simbólicas • Expresión. • Variables • Sentencias • Exp. y operaciones aritméticas • Operaciones de entrada / salida.	El o la docente: • Define los elementos que componen un programa en un lenguaje de ambiente visual. • Describe el uso y aplicaciones de los diferentes elementos que componen la estructura del programa. • Explica la sintaxis y normas para la declaración y manejo de los diferentes elementos. • Diseña programas en un lenguaje de ambiente visual utilizando los diferentes elementos que definen su estructura.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante : • Identifica los elementos que componen un programa en un lenguaje de ambiente visual. • Reconoce el uso y aplicaciones de los diferentes elementos que componen la estructura del programa. • Sigue la sintaxis y normas para la declaración y manejo de los diferentes elementos. • Desarrolla programas en un lenguaje de ambiente visual utilizando los diferentes elementos que definen su estructura.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

2. Utilizar las funciones y herramientas disponibles en un lenguaje de ambiente visual para el control del programa.	• Sentencias de control:
	  • Simples:
	    • De asignación
	    • Goto.
	  • Estructuradas:
	    • Compuestas
	    • Condicionales.
	  • Repetitivas:
	    • Bucles
	    • Concepto
	    • Diseño
	    • Terminación.
	  • Sentencias para el manejo de bucles
	  • Bucles anidados.
		El o la docente:
		• Define las sentencias de control.
		• Describe el uso y aplicaciones de cada una de las sentencias
		• Explica la sintaxis y normas para la declaración y manejo de las sentencias.
		• Diseña programas en ambiente Visual utilizando las diferentes sentencias existentes.
			• Comportarse de manera transparente con sus semejantes.	• Utiliza las funciones y herramientas disponibles en un lenguaje de ambiente visual para el control del programa.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante : • Identifica las sentencias de control. • Sigue la sintaxis y normas para la declaración y manejo de las sentencias. • Selecciona de acuerdo con uso y aplicaciones la sentencia adecuada. • Desarrolla programas en un lenguaje de ambiente visual utilizando las diferentes sentencias.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
3. Desarrollar programas utilizando los elementos de programación modular en un lenguaje de ambiente visual.	• Procedimientos: • Ubicación dentro del programa • Declaración • Llamadas • Diseño • Transferencia de información: • Parámetros valor y variable • Variables locales y globales • Efectos laterales • Identificadores.	El o la docente: • Define los procedimientos, función, arreglos, registros y archivos en el ámbito. • Describe el uso y aplicaciones de los procedimientos, función, arreglos, registros y archivos. • Explica el uso del procedimiento, función, arreglos, registros y archivos para la solución de problemas específicos. • Desarrolla programas en un lenguaje de ambiente visual que utilicen estas estructuras.	• Comportarse de manera transparente con sus semejantes.	• Desarrolla programas utilizando los elementos de programación modular en un lenguaje de ambiente visual.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

	• Funciones:
	  • Predefinidas
	  • Definidas por el usuario
	  • Resultados no numéricos
	  • Aritméticas
	  • Exponenciales
	  • Logarítmicas
	  • Trigonométricas
	  • De conversión
	  • Generadora de números aleatorios
	  • Subcadenas
	  • Alfabéticas
	  • Repetición de caracteres
	  • Información
	  • Conversión
	  • Calendario.
		El o la estudiante:
		• Reconoce los procedimientos y funciones en el ámbito de un lenguaje de ambiente visual.
		• Diseña programas en un lenguaje de ambiente visual utilizando procedimientos y funciones.
		• Ejemplifica el uso del procedimiento, función, arreglos, registros y archivos para la solución de problemas específicos.
		• Elabora programas en un lenguaje de ambiente visual donde se utilizan estas estructuras.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

4. Utilizar los diferentes comandos, instrucciones, funciones y controles disponibles para el desarrollo de programas.	• Controles receptores de texto:
	  • Etiquetas
	  • Cuadros de texto
	  • Listas
	  • Botones de órdenes
	  • Cuadros de diálogo.
	• Controles de selecciones de opciones o valores:
	  • Casillas de verificación
	  • Botones de opción
	  • Barras de desplazamiento
	  • Control de sucesos a intervalos de tiempo.
	• Controles comunes
	  • ActiveX
	  • Texto en formato RTF
	  • Barra de estado
	  • Incremento y decremento de valores
	  • Páginas múltiples.
		El o la docente:
		• Define las diferentes estructuras de control disponibles en un lenguaje de ambiente visual.
		• Describe las aplicaciones de cada una de estas estructuras.
		• Utiliza controles receptores de texto, de selección de opciones y controles comunes.
		• Diseña programas que utilicen los diferentes tipos de control disponibles.
			• Comportarse de manera transparente con sus semejantes.	• Utiliza los diferentes comandos, instrucciones, funciones y controles disponibles para el desarrollo de programas.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
	• Visualización de imágenes. • Animaciones. • Barra de herramientas. • Calendario.	El o la estudiante : • Define las diferentes estructuras de control disponibles en un lenguaje de ambiente visual. • Soluciona diferentes problemas por medio del uso de los controles disponibles. • Aplica controles receptores de texto, de selección de opciones y controles comunes. • Diseña programas que utilicen los diferentes tipos de control disponibles.		

PRÁCTICAS Y LISTAS DE COTEJO

DESARROLLO DE LA PRÁCTICA

UNIDAD DE ESTUDIO: Introducción a la Programación en Ambiente Visual	PRÁCTICA No. 1

Propósito:

Escenario: Aula	Duración:

MATERIALES	MAQUINARIA	EQUIPO	HERRAMIENTA

Procedimientos

El o la docente:

- Definición de conceptos básicos relacionados con el entorno de trabajo.
- Explicación de características, usos, utilidades y manejo de las herramientas disponibles.
- Observación del procedimiento de selección de menús y opciones.
- Utilización de accesos y funciones del entorno de trabajo.
- Define los elementos que componen un programa en un lenguaje de ambiente visual.
- Describe el uso y aplicaciones de los diferentes elementos que componen la estructura del programa.
- Explica la sintaxis y normas para la declaración y manejo de los diferentes elementos.
- Diseña programas en un lenguaje de ambiente visual utilizando los diferentes elementos que definen su estructura.
- Define los procedimientos, función, arreglos, registros y archivos en el ámbito.
- Describe el uso y aplicaciones de los procedimientos, función, arreglos, registros y archivos.
- Explica el uso del procedimiento, función, arreglos, registros y archivos para la solución de problemas específicos.
- Desarrolla programas en un lenguaje de ambiente visual que utilicen estas estructuras.
- Define las diferentes estructuras de control disponibles en un lenguaje de ambiente visual.
- Describe las aplicaciones de cada una de estas estructuras.
- Diseña programas que utilicen los diferentes tipos de control disponibles.

LISTA DE COTEJO SUGERIDA	Fecha:

Nombre del o la estudiante:	

Instrucciones:
- A continuación se presentan los criterios que van a ser verificados en el desempeño del o la estudiante mediante la observación del mismo. De la siguiente lista marque con una "X" aquellas observaciones que hayan sido cumplidas por el o la estudiante durante su desempeño.

DESARROLLO	SI	AUN NO	NO APLICA
Identifica correctamente los conceptos básicos relacionados con el entorno de trabajo.			
Reconoce con precisión las características, usos, utilidades y manejo de las herramientas disponibles.			
Selecciona adecuadamente diferentes menús y opciones.			
Utiliza eficientemente los accesos y funciones del entorno de trabajo.			
Identifica correctamente los elementos que componen un programa en un lenguaje de ambiente visual.			
Reconoce con precisión el uso y aplicaciones de los diferentes elementos que componen la estructura del programa.			
Sigue de forma correcta la sintaxis y normas para la declaración y manejo de los diferentes elementos.			
Desarrolla programas en un lenguaje de ambiente visual utilizando los diferentes elementos que definen su estructura.			
Identifica adecuadamente las sentencias de control.			
Sigue de forma correcta la sintaxis y normas para la declaración y manejo de las sentencias.			

DESARROLLO	SI	AUN NO	NO APLICA
Selecciona adecuadamente de acuerdo con uso y aplicaciones la sentencia adecuada.			
Utiliza eficientemente cada uno de los tipos de sentencias en la solución de problemas.			
Desarrolla correctamente programas en un lenguaje de ambiente visual utilizando las diferentes sentencias.			
Reconoce adecuadamente los procedimientos y funciones en el ámbito de un lenguaje de ambiente visual.			
Diseña correctamente programas en un lenguaje de ambiente visual utilizando procedimientos y funciones.			
Ejemplifica el uso del procedimiento, función, arreglos, registros y archivos para la solución de problemas específicos sin margen de error.			
Elabora correctamente programas en un lenguaje de ambiente visual donde se utilizan estas estructuras.			
Define con claridad las diferentes estructuras de control disponibles en un lenguaje de ambiente visual.			
Soluciona diferentes problemas por medio del uso de los controles disponibles sin margen de error.			
Aplica controles receptores de texto, de selección de opciones y controles comunes con eficiencia.			
Diseña correctamente programas que utilicen los diferentes tipos de control disponibles.			

OBSERVACIONES:

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Utilizar las funciones y herramientas disponibles en el entorno de trabajo.	Utiliza las funciones y herramientas disponibles en el entorno de trabajo.	Identifica los conceptos básicos relacionados con el entorno de trabajo.	Conocimiento	Identifica correctamente los conceptos básicos relacionados con el entorno de trabajo.
		Reconoce las características, usos, utilidades y manejo de las herramientas disponibles.	Conocimiento	Reconoce con precisión las características, usos, utilidades y manejo de las herramientas disponibles.
		Selecciona diferentes menús y opciones.	Desempeño	Selecciona adecuadamente diferentes menús y opciones.
		Utiliza los accesos y funciones del entorno de trabajo.	Desempeño	Utiliza eficientemente los accesos y funciones del entorno de trabajo.
		Identifica los elementos que componen un programa en un lenguaje de ambiente visual.	Conocimiento	Identifica correctamente los elementos que componen un programa en un lenguaje de ambiente visual.
		Reconoce el uso y aplicaciones de los diferentes elementos que componen la estructura del programa.	Conocimiento	Reconoce con precisión el uso y aplicaciones de los diferentes elementos que componen la estructura del programa.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
		Sigue la sintaxis y normas para la declaración y manejo de los diferentes elementos.	Desempeño	Sigue de forma correcta la sintaxis y normas para la declaración y manejo de los diferentes elementos.
		Desarrolla programas en un lenguaje de ambiente visual utilizando los diferentes elementos que definen su estructura.	Producto	Desarrolla programas en un lenguaje de ambiente visual utilizando los diferentes elementos que definen su estructura.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Utilizar las funciones y herramientas disponibles en un lenguaje de ambiente visual para el control del programa.	Utiliza las funciones y herramientas disponibles en un lenguaje de ambiente visual para el control del programa.	Identifica las sentencias de control.	Conocimiento	Identifica adecuadamente las sentencias de control.
		Sigue la sintaxis y normas para la declaración y manejo de las sentencias.	Conocimiento	Sigue de forma correcta la sintaxis y normas para la declaración y manejo de las sentencias.
		Selecciona de acuerdo con uso y aplicaciones la sentencia adecuada.	Desempeño	Selecciona adecuadamente de acuerdo con uso y aplicaciones la sentencia adecuada.
		Desarrolla programas en un lenguaje de ambiente visual utilizando las diferentes sentencias.	Producto	Desarrolla correctamente programas en un lenguaje de ambiente visual utilizando las diferentes sentencias.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Desarrollar programas utilizando los elementos de programación modular en un lenguaje de ambiente visual.	Desarrolla programas utilizando los elementos de programación modular en un lenguaje de ambiente visual.	Reconoce los procedimientos y funciones en el ámbito de un lenguaje de ambiente visual.	Conocimiento	Reconoce adecuadamente los procedimientos y funciones en el ámbito de un lenguaje de ambiente visual.
		Diseña programas en un lenguaje de ambiente visual utilizando procedimientos y funciones.	Producto	Diseña correctamente programas en un lenguaje de ambiente visual utilizando procedimientos y funciones.
		Ejemplifica el uso del procedimiento, función, arreglos, registros y archivos para la solución de problemas específicos.	Desempeño	Ejemplifica el uso del procedimiento, función, arreglos, registros y archivos para la solución de problemas específicos sin margen de error.
		Elabora programas en un lenguaje de ambiente visual donde se utilizan estas estructuras.	Producto	Elabora correctamente programas en un lenguaje de ambiente visual donde se utilizan estas estructuras.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Utilizar los diferentes comandos, instrucciones, funciones y controles disponibles para el desarrollo de programas.	Utiliza los diferentes comandos, instrucciones, funciones y controles disponibles para el desarrollo de programas.	Define las diferentes estructuras de control disponibles en un lenguaje de ambiente visual.	Conocimiento	Define con claridad las diferentes estructuras de control disponibles en un lenguaje de ambiente visual.
		Soluciona diferentes problemas por medio del uso de los controles disponibles.	Producto	Soluciona diferentes problemas por medio del uso de los controles disponibles sin margen de error.
		Aplica controles receptores de texto, de selección de opciones y controles comunes.	Desempeño	Aplica controles receptores de texto, de selección de opciones y controles comunes con eficiencia.
		Diseña programas que utilicen los diferentes tipos de control disponibles.	Producto	Diseña correctamente programas que utilicen los diferentes tipos de control disponibles.

NORMA TÉCNICA DE INSTITUCIÓN EDUCATIVA

DATOS GENERALES

Titulo: Gestión Empresarial
Propósito: Convivencia efectiva en el entorno del sector productivo nacional.
Nivel de competencia: Básica

UNIDADES DE COMPETENCIA LABORAL QUE CONFORMAN LA NORMA

Título	Clasificación
Identifica correctamente conceptos relacionados con empresas.	Específica
Distingue correctamente los tipos de empresas.	Específica
Explica la contribución de las empresas en la economía nacional con eficiencia.	Específica
Relaciona adecuadamente elementos de la globalización con la posición de nuestro país en la economía mundial.	Específica
Describe con precisión la influencia de la globalización y la tecnología en la realidad costarricense.	Específica
Reconoce eficientemente los conceptos básicos y características de la administración.	Específica
Distingue adecuadamente las áreas funcionales de la empresa.	Específica
Describe de forma correcta los procesos de selección y contratación de personal.	Específica
Reconoce eficientemente los principales aspectos relacionados con el Código de Trabajo.	Específica
Identifica correctamente los elementos básicos del servicio al cliente y la calidad total.	Específica
Emplea adecuadamente los diferentes elementos de supervisión de personal en la solución de casos con eficiencia.	Específica
Ejemplifica los elementos que participan en la supervisión de personal con eficiencia.	Específica
Describe adecuadamente la aplicación de ISO en la empresa en términos de mejora.	Específica
Relaciona con claridad la existencia de sistemas de calidad con satisfacción del cliente.	Específica
Define adecuadamente los conceptos básicos relacionados con el proceso de planificación, organización, dirección y control.	Específica
Elabora un plan de acción con eficiencia.	Específica
Define con claridad los conceptos básicos relacionados con el análisis FODA.	Específica
Identifica correctamente fortalezas, oportunidades, debilidades y amenazas en casos específicos.	Específica
Explica los aspectos que se deben tomar en cuenta para el diseño y distribución de la planta física	Específica

con eficiencia.

Organiza adecuadamente las zonas de almacenamiento en una empresa.	Específica
Describe los elementos que intervienen en el ambiente de trabajo, en función de la eficiencia.	Específica
Elabora un plan de producción de una empresa con eficiencia.	Específica
Define adecuadamente los conceptos básicos y características del mercadeo.	Específica
Enumera de forma correcta las necesidades del cliente en función de una actividad empresarial.	Específica
Describe adecuadamente las mezclas de mercadeo que se pueden presentar con un producto o servicio.	Específica
Elabora un plan de mercadeo de un producto o servicio con eficiencia.	Específica
Define con claridad los conceptos básicos relacionados con los proyectos informáticos.	Específica
Reconoce eficientemente las características principales de los proyectos informáticos.	Específica
Distingue correctamente los errores clásicos en los que se incurre durante la gestión y desarrollo.	Específica
Aplica estrategias para la gestión de los riesgos con eficiencia.	Específica
Define con claridad el concepto de ciclo de vida de un proyecto.	Específica
Reconoce eficientemente las características del ciclo de vida de un proyecto.	Específica
Aplica adecuadamente las técnicas para la selección del ciclo de vida.	Específica
Aplica adecuadamente las estrategias para realizar diferentes estimaciones.	Específica
Identifica correctamente los objetivos de la planificación de proyectos informáticos.	Específica
Utiliza adecuadamente las estrategias para la planificación de proyectos.	Específica
Distingue correctamente las causas y consecuencias de la presión sobre la planificación.	Específica
Utiliza con exactitud diferentes herramientas para el aumento de la productividad.	Específica
Elabora diferentes presupuestos de acuerdo a proyectos específicos sin margen de error.	Específica
Distingue correctamente los aspectos de diseño y presentación de proyectos específicos para el campo informático.	Específica
Sigue el procedimiento para la creación de la documentación del proyecto sin margen de error.	Específica
Aplica las normas básicas para la elaboración de un proyecto específico para el campo informático con eficiencia.	Específica
Aplica adecuadamente las técnicas para la elaboración de proyectos específicos para el campo informático.	Específica
Comenta con claridad la importancia de las pasantías en las empresas con eficiencia.	Específica
Menciona la filosofía de las pasantías con eficiencia.	Específica
Elabora un informe de las experiencias vividas en la empresa con eficiencia.	Específica

Elementos de competencia

Referencia	Título del elemento
3 - 3	Convivencia efectiva en el entorno del sector productivo nacional

Criterios de desempeño:

1. Identifica los aspectos que intervienen en la definición del entorno nacional e internacional del sector productivo.
2. Identifica los aspectos relacionados con la calidad en el contexto empresarial.
3. Distingue los aspectos básicos relacionados con la planificación, organización, dirección y control en el contexto empresarial.
4. Reconoce los aportes del FODA al proceso de planificación en la empresa.
5. Distingue las características y aplicaciones del plan de producción en la empresa.
6. Distingue los componentes principales del mercadeo de bienes o servicios.
7. Distingue los principales aspectos de la gestión y desarrollo de proyectos informáticos.
8. Utiliza diferentes estrategias para la planificación de proyectos informáticos.
9. Aplica las técnicas en la elaboración de presupuestos para proyectos específicos del campo de la informática.
10. Aplica las técnicas en la elaboración de proyectos específicos para el campo informático.

Campo de aplicación:

Categoría	Clase
Servicios	Prestación de servicios de Educación Técnica

Evidencias de desempeño:

1. Distingue los tipos de empresas.
2. Relaciona elementos de la globalización con la posición de nuestro país en la economía mundial.
3. Distingue las áreas funcionales de la empresa.
4. Sintetiza los aspectos básicos de la administración de recurso humano.
5. Emplea los diferentes elementos de supervisión de personal en la solución de casos.

6. Distingue las conductas adecuadas en la empresa.
7. Señala aspectos importantes para la motivación, desarrollo de interés y valores en el personal.
8. Describe la aplicación de normas y certificaciones de calidad en la empresa en términos de mejora.
9. Relaciona la existencia de sistemas de calidad con satisfacción del cliente.
10. Elabora un plan de acción.
11. Explica los aspectos que se deben tomar en cuenta para el diseño y distribución de la planta física.
12. Organiza las zonas de almacenamiento en una empresa.
13. Describe los elementos que intervienen en el ambiente de trabajo, en función de la eficiencia.
14. Enumera las necesidades del cliente en función de una actividad empresarial.
15. Describe las mezclas de mercadeo que se pueden presentar con un producto o servicio.
16. Distingue los errores clásicos en los que se incurre durante la gestión y desarrollo.
17. Aplica estrategias para la gestión de los riesgos.
18. Aplica las estrategias para realizar diferentes estimaciones.
19. Distingue las causas y consecuencias de la presión sobre la planificación.
20. Distingue los aspectos de diseño y presentación de proyectos específicos para el campo informático.
21. Sigue el procedimiento para la creación de la documentación del proyecto.

Evidencias de producto:

1. Aplica el FODA en la planificación de una empresa nueva.
2. Elabora un plan de producción de una empresa.
3. Elabora un plan de mercadeo de un producto o servicio.
4. Diseña estrategias para la planificación de proyectos.
5. Utiliza herramientas para el aumento de la productividad.
6. Elabora diferentes presupuestos de acuerdo a proyectos específicos.
7. Diseña un proyecto específico para el campo informático.

Evidencias de conocimiento:

1. Reconoce la influencia de la globalización y la tecnología en la realidad costarricense.
2. Reconoce las cualidades de un empresario exitoso.
3. Identifica los tipos y características del liderazgo.
4. Reconoce los conceptos básicos y características de la administración.
5. Reconoce los principales aspectos relacionados con el Código de Trabajo.
6. Identifica los elementos básicos del servicio al cliente y la calidad total.
7. Reconoce la importancia de los sistemas de calidad en el desempeño empresarial.
8. Define los conceptos básicos relacionados con el proceso de planificación, organización, dirección y control.
9. Define los conceptos básicos relacionados con el análisis FODA.
10. Identifica fortalezas, oportunidades, debilidades y amenazas en casos específicos.
11. Define los conceptos básicos y características del mercadeo.
12. Define los conceptos básicos relacionados con los proyectos informáticos.
13. Reconoce las características principales de los proyectos informáticos.
14. Define el concepto de ciclo de vida de un proyecto.
15. Reconoce las características del ciclo de vida en la elaboración de proyectos informáticos.
16. Identifica los objetivos de la planificación de proyectos informáticos.
17. Reconoce los componentes de un presupuesto para un proyecto informático.
18. Reconoce los componentes de un proyecto específico para el campo informático.

Modalidad: Comercial y Servicios	Especialidad: Computer Networking

Sub-área: Manipulación de la Información	Año: Undécimo

Unidad de Estudio: Gestión Empresarial	Tiempo Estimado: 60 horas

Propósito: Convivencia efectiva en el entorno del sector productivo nacional.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

1. Reconocer los componentes del proceso administrativo en el ámbito de trabajo asociado a la informática.	• Empresa:
	  • Concepto
	  • Tipos de empresas.
	• Relación empresa - comunidad.
	• Costa Rica en el mercado mundial:
	  • Exportación e importación
	  • Globalización
	  • Comercio internacional
	  • Tecnología moderna
	  • Competencia y competitividad.
		El o la docente:
		• Define los conceptos básicos sobre tipos de empresas.
		• Ejemplifica los aspectos que definen la ubicación de Costa Rica en el mercado mundial.
		• Discute acerca de la influencia de la globalización, la tecnología y competitividad en la realidad costarricense.
			• Conciencia acerca de los que somos, de nuestras fortalezas y debilidades.	• Reconoce los componentes del proceso administrativo en el ámbito de trabajo asociado a la informática.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante: • Identifica conceptos relacionados con Empresas. • Relaciona elementos de la globalización con la posición de nuestro país en la economía mundial. • Describe la influencia de la globalización y la tecnología en la realidad costarricense.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

	• Administración:
	  • Concepto
	  • Características
	  • Áreas funcionales:
	    • Producción
	    • Mercadeo
	    • Recursos humanos
	    • Finanzas
	  • Administración financiera:
	    • Concepto
	    • Procedimientos
	    • Aspectos jurídicos.
	  • Administración del recurso humano:
	    • Contratación y selección
	    • Motivación
	    • Comportamiento organizacional
	  • Servicio al cliente / calidad total.
		El o la docente:
		• Define los conceptos básicos relacionados con la administración.
		• Clasifica las áreas funcionales de la empresa.
		• Ejemplifica los procesos de selección y contratación de personal.
		• Describe los principales elementos contenidos en el Código de Trabajo en materia de supervisión.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
	• Aspectos de supervisión: • Motivación del personal • Realimentación positiva • Resolución de conflictos • Reconocimiento a la eficiencia. • Sistemas de calidad: • Concepto • Importancia de hacer las cosas bien desde el principio • Necesidades del cliente • Normas ISO 9000 para el funcionamiento de una empresa.	• Discute acerca de los elementos que inciden en el servicio al cliente y la calidad total. • Sintetiza el concepto y características de la supervisión de personal. • Explica los elementos que participan en la supervisión de personal. • Relaciona los sistemas de calidad y satisfacción del cliente.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante: • Reconoce los conceptos básicos y características de la administración. • Distingue las áreas funcionales de la empresa. • Describe los procesos de selección y contratación de personal. • Reconoce los principales aspectos relacionados con el Código de Trabajo. • Identifica los elementos básicos del servicio al cliente y la calidad total. • Emplea los diferentes elementos de supervisión de personal en la solución de casos. • Ejemplifica los elementos que participan en la supervisión de personal. • Describe de la Aplica de ISO en la empresa en términos de mejora. • Relaciona la existencia de sistemas de calidad con satisfacción del cliente.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
2. Elaborar un plan de negocio para una micro empresa que se desempeñará en el área de la informática.	• Planificación, organización, dirección y control: • Concepto • Importancia • Aplicaciones • Análisis de la empresa en la comunidad • Elaboración de un plan de acción personal y empresarial. • Análisis FODA: • Concepto • Fortalezas • Oportunidades • Debilidades • Amenazas • Otros aspectos internos y externos de la empresa • El análisis FODA como instrumento de planificación.	El o la docente: • Define los conceptos básicos de planificación, organización, dirección y control. • Elabora un plan de acción. • Define los conceptos básicos relacionados con el análisis FODA • Identifica las fortalezas, oportunidades, debilidades y amenazas.	• Conciencia acerca de los que somos, de nuestras fortalezas y debilidades.	• Elabora un plan de negocio para una micro empresa que se desempeñará en el área de la informática.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante: • Define los conceptos básicos relacionados con el proceso de planificación, organización, dirección y control. • Elabora un plan de acción. • Define los conceptos básicos relacionados con el análisis FODA. • Identifica fortalezas, oportunidades, debilidades y amenazas en casos específicos.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

	• Plan de producción:
	 • Concepto
	 • Características
	 • Elementos de eficiencia
	 • Diseño y distribución de la planta física:
	   • Zonas de almacenamiento: materia prima, producto terminado.
	   • Ambiente de trabajo
	   • Áreas de Ventilación
	   • Iluminación
	   • Efecto psicológico del color
	   • Espacio de trabajo
	   • Distribución eléctrica
	   • Señalamiento de zonas.
		El o la docente:
		 • Explica el plan de producción en una empresa dedicada a actividades propias de la especialidad.
		 • Identifica las zonas de almacenamiento de materia prima y producto terminado.
		 • Describe el ambiente de trabajo que debe imperar en una empresa para lograr mayor eficiencia.
		 • Elabora un plan de producción de una empresa.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante: • Explica los aspectos que se deben tomar en cuenta para el diseño y distribución de la planta física. • Organiza las zonas de almacenamiento en una empresa. • Describe los elementos que intervienen en el ambiente de trabajo, en función de la eficiencia. • Elabora un plan de producción de una empresa.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

	• Mercadeo:
	  • Concepto
	  • Características.
	• Características de un mercado:
	  • Tipos de clientes
	  • Motivos para comprar del cliente.
	  • Segmentación del mercado
	  • La competencia Oferta - Demanda
	• Mezclas de mercadeo:
	  • Producto
	  • Precio
	  • Plaza
	  • Promoción.
	• Plan de mercadeo:
	  • Diseño de un producto o servicio nuevo
	  • Elaboración del plan
	  • Presentación de los productos
	  • Evaluación de los productos.
		El o la docente:
		• Define los conceptos y características del mercadeo.
		• Identifica el cliente y sus necesidades en relación con la actividad empresarial que se proyecta realizar.
		• Explica las posibles mezclas de mercado que se pueden presentar en una actividad empresarial.
		• Elabora el plan de mercadeo de un producto o servicio nuevo relacionado con la especialidad.		

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RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante: • Define los conceptos básicos y características del mercadeo. • Enumera las necesidades del cliente en función de una actividad empresarial. • Describe las mezclas de mercadeo que se pueden presentar con un producto o servicio. • Elabora un plan de mercadeo de un producto o servicio.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

3. Utilizar diferentes estrategias para la gestión y desarrollo de proyectos informáticos.	• Proyectos informáticos:
	  • Concepto
	  • Características
	  • Errores clásicos en la programación del desarrollo
	  • Gestión de riesgos.
	• Ciclo de vida del proyecto:
	  • Concepto
	  • Características
	  • Tipos de diseño:
	   • Cascada
	   • Prototipado
	   • Entrega por etapas
	   • Entrega evolutiva
	   • Otros.
	  • Selección del ciclo de vida más rápido para un proyecto específico.
		El o la docente:
		• Define los conceptos básicos relacionados con los proyectos informáticos.
		• Describe las características principales de los proyectos informáticos.
		• Identifica los errores clásicos en los que se incurre durante la gestión y desarrollo de proyectos informáticos.
		• Identifica las características del ciclo de vida de un proyecto informático.
			• Conciencia acerca de los que somos, de nuestras fortalezas y debilidades.	• Utiliza diferentes estrategias para la gestión y desarrollo de proyectos informáticos.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

	• Estimación:
	  • Del tamaño
	  • Del esfuerzo
	  • De la planificación
	  • Refinamiento.
	• Planificación:
	  • Objetivos
	  • Estrategias
	  • Planificación demasiado optimista
	  • Presión sobre la planificación
	• Desarrollo orientado al cliente.
		• Describe los elementos del ciclo de vida de un proyecto informático.
		• Ilustra las estrategias para realizar estimaciones.
		• Identifica los objetivos de la planificación de proyectos informáticos.
		• Describe las estrategias para la planificación de proyectos.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO

	• Control de calidad:
	  • Motivación
	  • Trabajo en equipo
	  • Negociación.
	• Herramientas para el aumento de la productividad.
	• Presupuesto:
	  • Componentes
	  • Estrategias para la elaboración.
	• Proyectos informáticos:
	  • Componentes para su elaboración
	  • Aspectos de diseño y presentación
	  • Documentación
		• Explica las causas y consecuencias de la planificación demasiado optimista.
		• Ilustra las causas y consecuencias de la presión sobre la planificación.
		• Demuestra el uso de diferentes herramientas para el aumento de la productividad.
		• Plantea diferentes presupuestos de acuerdo a proyectos específicos.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		• Describe los aspectos de diseño y presentación de proyectos específicos para el campo informático. • Ilustra el procedimiento para la creación de la documentación del proyecto. • Ejemplifica las normas básicas para la elaboración de un proyecto específico para el campo informático. • Demuestra los pasos a seguir para la elaboración de proyectos específicos para el campo informático.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante: • Define los conceptos básicos relacionados con los proyectos informáticos. • Reconoce las características principales de los proyectos informáticos. • Distingue los errores clásicos en los que se incurre durante la gestión y desarrollo. • Aplica estrategias para la gestión de los riesgos. • Define el concepto de ciclo de vida de un proyecto. • Aplica las técnicas para la selección del ciclo de vida.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		• Identifica los objetivos de la planificación de proyectos informáticos. • Utiliza las estrategias para la planificación de proyectos. • Distingue las causas y consecuencias de la planificación demasiado optimista. • Utiliza diferentes herramientas para el aumento de la productividad.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		• Reconoce los componentes de un presupuesto para un proyecto informático. • Elabora diferentes presupuestos de acuerdo a proyectos específicos. • Distingue los aspectos de diseño y presentación de proyectos específicos para el campo informático. • Sigue el procedimiento para la creación de la documentación del proyecto. • Aplica las normas básicas para la elaboración de un proyecto específico para el campo informático. • Aplica las técnicas para la elaboración de proyectos específicos para el campo informático.		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
4. Aplicar destrezas, habilidades y conocimientos adquiridos referentes a la programación por medio de una pasantía.	• Pasantías	El o la docente: • Explica la importancia de las pasantías en las empresas. • Señala cuál es la filosofía de las pasantías. • Describe las experiencias en cada una de las tareas a realizar en la empresa. • Planifica la pasantía en las empresas del entorno, coordinando con los coordinadores técnicos, empresa y Director.	• Esfuerzo que se realiza para conseguir algo por uno mismo o con la ayuda de los demás	• Aplica destrezas, habilidades y conocimientos adquiridos referentes a la programación por medio de una pasantía

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		El o la estudiante: • Comenta de la importancia de las pasantías en las empresas. • Menciona la filosofía de las pasantías. • Elabora un informe de las experiencias vividas en la empresa. • Organiza la pasantía en una empresa del entorno, coordinando con los coordinadores técnicos, empresa y Director.		

PRACTICAS Y LISTAS DE COTEJO

DESARROLLO DE LA PRACTICA

UNIDAD DE ESTUDIO: Gestión Empresarial	PRÀCTICA No. 1

Propósito:

Escenario: Aula	Duración:

MATERIALES	MAQUINARIA	EQUIPO	HERRAMIENTA

Procedimientos

El o la docente:

- Define los conceptos básicos sobre tipos de empresas.
- Ejemplifica los aspectos que definen la ubicación de Costa Rica en el mercado mundial.
- Discute acerca de la influencia de la globalización, la tecnología y competitividad en la realidad costarricense.
- Define los conceptos básicos relacionados con la administración.
- Clasifica las áreas funcionales de la empresa.
- Ejemplifica los procesos de selección y contratación de personal.
- Discute acerca de los elementos que inciden en el servicio al cliente y la calidad total.
- Sintetiza el concepto y características de la supervisión de personal.
- Explica los elementos que participan en la supervisión de personal.
- Discute acerca de la importancia de los sistemas de calidad en el desempeño empresarial.
- Relaciona los sistemas de calidad y satisfacción del cliente.
- Define los conceptos básicos de planificación, organización, dirección y control.
- Elabora un plan de acción.
- Define los conceptos básicos relacionados con el análisis FODA
- Identifica las fortalezas, oportunidades, debilidades y amenazas.
- Explica el plan de producción en una empresa dedicada a actividades propias de la especialidad.
- Identifica las zonas de almacenamiento de materia prima y producto terminado.
- Describe el ambiente de trabajo que debe imperar en una empresa para lograr mayor eficiencia.
- Elabora un plan de producción de una empresa.
- Define los conceptos y características del mercadeo.
- Identifica el cliente y sus necesidades en relación con la actividad empresarial que se proyecta realizar.
- Explica las posibles mezclas de mercado que se pueden presentar en una actividad empresarial.
- Elabora el plan de mercadeo de un producto o servicio nuevo relacionado con la especialidad.
- Define los conceptos básicos relacionados con los proyectos informáticos.

Procedimientos

El o la docente:

- Describe las características principales de los proyectos informáticos.
- Identifica los errores clásicos en los que se incurre durante la gestión y desarrollo de proyectos informáticos.
- Identifica las características del ciclo de vida de un proyecto informático.
- Describe los elementos del ciclo de vida de un proyecto informático.
- Ilustra las estrategias para realizar estimaciones.
- Identifica los objetivos de la planificación de proyectos informáticos.
- Describe las estrategias para la planificación de proyectos.
- Explica las causas y consecuencias de la planificación demasiado optimista.
- Ilustra las causas y consecuencias de la presión sobre la planificación.
- Demuestra el uso de diferentes herramientas para el aumento de la productividad.
- Describe los componentes de un presupuesto para un proyecto informático.
- Ilustra las técnicas para la elaboración de presupuestos.
- Plantea diferentes presupuestos de acuerdo a proyectos específicos.
- Ejemplifica las normas básicas para la elaboración de un proyecto específico para el campo informático.
- Demuestra los pasos a seguir para la elaboración de proyectos específicos para el campo informático.
- Explica la importancia de las pasantías en las empresas.
- Señala cuál es la filosofía de las pasantías.
- Describe las experiencias en cada una de las tareas a realizar en la empresa.
- Planifica la pasantía en las empresas del entorno, coordinando con los coordinadores técnicos, empresa   y Director.

LISTA DE COTEJO SUGERIDA	Fecha:

Nombre del o la estudiante:	

Instrucciones:
- A continuación se presentan los criterios que van a ser verificados en el desempeño del o la estudiante mediante la observación del mismo. De la siguiente lista marque con una "X" aquellas observaciones que hayan sido cumplidas por el o la estudiante durante su desempeño.

DESARROLLO	SI	AUN NO	NO APLICA
Identifica correctamente conceptos relacionados con empresas.			
Relaciona adecuadamente elementos de la globalización con la posición de nuestro país en la economía mundial.			
Describe con precisión la influencia de la globalización y la tecnología en la realidad costarricense.			
Reconoce eficientemente los conceptos básicos y características de la administración.			
Distingue adecuadamente las áreas funcionales de la empresa.			
Describe de forma correcta los procesos de selección y contratación de personal.			
Reconoce eficientemente los principales aspectos relacionados con el Código de Trabajo.			
Identifica correctamente los elementos básicos del servicio al cliente y la calidad total.			
Emplea adecuadamente los diferentes elementos de supervisión de personal en la solución de casos con eficiencia.			
Ejemplifica los elementos que participan en la supervisión de personal con eficiencia.			
Describe adecuadamente la aplicación de ISO en la empresa en términos de mejora.			
Relaciona con claridad la existencia de sistemas de calidad con satisfacción del cliente.			

DESARROLLO	SI	AUN NO	NO APLICA
Define adecuadamente los conceptos básicos relacionados con el proceso de planificación, organización, dirección y control.			
Elabora un plan de acción con eficiencia.			
Define con claridad los conceptos básicos relacionados con el análisis FODA.			
Identifica correctamente fortalezas, oportunidades, debilidades y amenazas en casos específicos.			
Explica los aspectos que se deben tomar en cuenta para el diseño y distribución de la planta física con eficiencia.			
Organiza adecuadamente las zonas de almacenamiento en una empresa.			
Describe los elementos que intervienen en el ambiente de trabajo, en función de la eficiencia.			
Elabora un plan de producción de una empresa con eficiencia.			
Define adecuadamente los conceptos básicos y características del mercadeo.			
Enumera de forma correcta las necesidades del cliente en función de una actividad empresarial.			
Describe adecuadamente las mezclas de mercadeo que se pueden presentar con un producto o servicio.			
Elabora un plan de mercadeo de un producto o servicio con eficiencia.			
Define con claridad los conceptos básicos relacionados con los proyectos informáticos.			
Reconoce eficientemente las características principales de los proyectos informáticos.			
Distingue correctamente los errores clásicos en los que se incurre durante la gestión y desarrollo.			
Aplica estrategias para la gestión de los riesgos con eficiencia.			
Define con claridad el concepto de ciclo de vida de un proyecto.			
Reconoce eficientemente las características del ciclo de vida de un proyecto.			

DESARROLLO	SI	AUN NO	NO APLICA
Aplica adecuadamente las técnicas para la selección del ciclo de vida.			
Aplica adecuadamente las estrategias para realizar diferentes estimaciones.			
Identifica correctamente los objetivos de la planificación de proyectos informáticos.			
Utiliza adecuadamente las estrategias para la planificación de proyectos.			
Distingue correctamente las causas y consecuencias de la planificación demasiado optimista.			
Distingue correctamente las causas y consecuencias de la presión sobre la planificación.			
Utiliza con exactitud diferentes herramientas para el aumento de la productividad.			
Elabora diferentes presupuestos de acuerdo a proyectos específicos sin margen de error.			
Sigue el procedimiento para la creación de la documentación del proyecto sin margen de error.			
Aplica las normas básicas para la elaboración de un proyecto específico para el campo informático con eficiencia.			
Comenta con claridad la importancia de las pasantías en las empresas con eficiencia.			
Menciona la filosofía de las pasantías con eficiencia.			
Elabora un informe de las experiencias vividas en la empresa con eficiencia.			

OBSERVACIONES:

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Reconocer los componentes del proceso administrativo en el ámbito de trabajo asociado a la informática.	Reconoce los componentes del proceso administrativo en el ámbito de trabajo asociado a la informática.	Identifica conceptos relacionados con Empresas.	Conocimiento	Identifica correctamente conceptos relacionados con Empresas.
		Relaciona elementos de la globalización con la posición de nuestro país en la economía mundial.	Desempeño	Relaciona adecuadamente elementos de la globalización con la posición de nuestro país en la economía mundial.
		Describe la influencia de la globalización y la tecnología en la realidad costarricense.	Conocimiento	Describe con precisión la influencia de la globalización y la tecnología en la realidad costarricense.

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
		Reconoce los conceptos básicos y características de la administración.	Conocimiento	Reconoce eficientemente los conceptos básicos y características de la administración.
		Distingue las áreas funcionales de la empresa.	Desempeño	Distingue adecuadamente las áreas funcionales de la empresa.
		Describe los procesos de selección y contratación de personal.	Desempeño	Describe de forma correcta los procesos de selección y contratación de personal.
		Reconoce los principales aspectos relacionados con el Código de Trabajo.	Conocimiento	Reconoce eficientemente los principales aspectos relacionados con el Código de Trabajo.
		Identifica los elementos básicos del servicio al cliente y la calidad total.	Conocimiento	Identifica correctamente los elementos básicos del servicio al cliente y la calidad total.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
		Emplea los diferentes elementos de supervisión de personal en la solución de casos.	Desempeño	Emplea adecuadamente los diferentes elementos de supervisión de personal en la solución de casos con eficiencia.
		Ejemplifica los elementos que participan en la supervisión de personal.	Desempeño	Ejemplifica los elementos que participan en la supervisión de personal con eficiencia.
		Describe la aplicación de ISO en la empresa en términos de mejora.	Desempeño	Describe adecuadamente la aplicación de ISO en la empresa en términos de mejora.
		Relaciona la existencia de sistemas de calidad con satisfacción del cliente.	Conocimiento	Relaciona con claridad la existencia de sistemas de calidad con satisfacción del cliente.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Elaborar un plan de negocio para una micro empresa que se desempeñará en el área de la informática.	Elabora un plan de negocio para una micro empresa que se desempeñará en el área de la informática.	Define los conceptos básicos relacionados con el proceso de planificación, organización, dirección y control.	Conocimiento	Define adecuadamente los conceptos básicos relacionados con el proceso de planificación, organización, dirección y control.
		Elabora un plan de acción.	Producto	Elabora un plan de acción con eficiencia.
		Define los conceptos básicos relacionados con el análisis FODA.	Conocimiento	Define con claridad los conceptos básicos relacionados con el análisis FODA.
		Identifica fortalezas, oportunidades, debilidades y amenazas en casos específicos.	Conocimiento	Identifica correctamente fortalezas, oportunidades, debilidades y amenazas en casos específicos.

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
		Explica los aspectos que se deben tomar en cuenta para el diseño y distribución de la planta física.	Conocimiento	Explica los aspectos que se deben tomar en cuenta para el diseño y distribución de la planta física con eficiencia.
		Organiza las zonas de almacenamiento en una empresa.	Desempeño	Organiza adecuadamente las zonas de almacenamiento en una empresa.
		Describe los elementos que intervienen en el ambiente de trabajo, en función de la eficiencia.	Conocimiento	Describe los elementos que intervienen en el ambiente de trabajo, en función de la eficiencia.
		Elabora un plan de producción de una empresa.	Producto	Elabora un plan de producción de una empresa con eficiencia.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
		Define los conceptos básicos y características del mercadeo.	Conocimiento	Define adecuadamente los conceptos básicos y características del mercadeo.
		Enumera las necesidades del cliente en función de una actividad empresarial.	Desempeño	Enumera de forma correcta las necesidades del cliente en función de una actividad empresarial.
		Describe las mezclas de mercadeo que se pueden presentar con un producto o servicio.	Desempeño	Describe adecuadamente las mezclas de mercadeo que se pueden presentar con un producto o servicio.
		Elabora un plan de mercadeo de un producto o servicio.	Producto	Elabora un plan de mercadeo de un producto o servicio con eficiencia.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Utilizar diferentes estrategias para la gestión y desarrollo de proyectos informáticos.	Utiliza diferentes estrategias para la gestión y desarrollo de proyectos informáticos.	Define los conceptos básicos relacionados con los proyectos informáticos.	Conocimiento	Define con claridad los conceptos básicos relacionados con los proyectos informáticos.
		Reconoce las características principales de los proyectos informáticos.	Desempeño	Reconoce eficientemente las características principales de los proyectos informáticos.
		Distingue los errores clásicos en los que se incurre durante la gestión y desarrollo.	Desempeño	Distingue correctamente los errores clásicos en los que se incurre durante la gestión y desarrollo.
		Aplica estrategias para la gestión de los riesgos.	Conocimiento	Aplica estrategias para la gestión de los riesgos con eficiencia.
		Define el concepto de ciclo de vida de un proyecto.	Conocimiento	Define con claridad el concepto de ciclo de vida de un proyecto.
		Aplica las estrategias para realizar diferentes estimaciones.	Desempeño	Aplica adecuadamente las estrategias para realizar diferentes estimaciones.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
		Identifica los objetivos de la planificación de proyectos informáticos.	Conocimiento	Identifica correctamente los objetivos de la planificación de proyectos informáticos.
		Utiliza las estrategias para la planificación de proyectos.	Desempeño	Utiliza adecuadamente las estrategias para la planificación de proyectos.
		Distingue las causas y consecuencias de la presión sobre la planificación.	Desempeño	Distingue correctamente las causas y consecuencias de la presión sobre la planificación.
		Utiliza diferentes herramientas para el aumento de la productividad.	Desempeño	Utiliza con exactitud diferentes herramientas para el aumento de la productividad.
		Reconoce los componentes de un presupuesto para un proyecto informático.	Conocimiento	Reconoce eficientemente los componentes de un presupuesto para un proyecto informático.
		Elabora diferentes presupuestos de acuerdo a proyectos específicos.	Producto	Elabora diferentes presupuestos de acuerdo a proyectos específicos sin margen de error.
		Distingue los aspectos de diseño y presentación de proyectos específicos para el campo informático.	Desempeño	Distingue correctamente los aspectos de diseño y presentación de proyectos específicos para el campo informático.

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CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
		Sigue el procedimiento para la creación de la documentación del proyecto.	Conocimiento	Sigue el procedimiento para la creación de la documentación del proyecto sin margen de error.
		Aplica las normas básicas para la elaboración de un proyecto específico para el campo informático.	Desempeño	Aplica las normas básicas para la elaboración de un proyecto específico para el campo informático con eficiencia.
		Aplica las técnicas para la elaboración de proyectos específicos para el campo informático.	Desempeño	Aplica adecuadamente las técnicas para la elaboración de proyectos específicos para el campo informático.

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

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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.