SECTOR:
COMMERCIAL AND SERVICES

PROGRAM
INFORMATION TECHNOLOGY SUPPORT

CURRICULAR DESIGN ON COMPETENCY BASED-EDUCATION

HIGH-RANKING AUTHORITIES
Dr. Leonardo Garnier Rímolo
Minister of Public Education

MSc. Dyalah Calderón de la O.
Public Education Academic Vice-Minister

MSc. Silvia Víquez Ramírez
Public Education Administrative Vice-Minister

MBA. Mario Mora Quirós
Planning and Regional Coordination Vice-Minister

General Management of Technical Education and Entrepreneurial Abilities
Ing. Fernando Bogantes Cruz
Director

Technical Education Department
Ing. Gerardo Ávila Villalobos
Chief Department

MSc. Damaris Foster Lewis
Chief Curricular Section

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

San José – Costa Rica

SECTOR:
COMMERCIAL AND SERVICES

PROGRAM:
INFORMATION TECHNOLOGY SUPPORT

TWELFTH GRADE

DESIGNED BY

MSc. Jerry Quintero Figueroa
Computer Science National Advisor

MSc. Lizzette Vargas Murillo and MSc. Maricel Cox Alvarado
English National Advisors


May, 2011

Corrections were made in this study program in October 2011, according to session 31-2011, act 10-31-2011 from September 5th, 2011

Contents

ACKNOWLEDGEMENTS

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

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

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

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

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

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

Presentation of Fundamentals

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

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

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

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

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

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

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

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

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

To respond to these objectives, various information technical programs were created. 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
INFORMATION TECHNOLOGY SUPPORT
(IT SUPPORT)

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

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

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

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

A new upgraded proposal is presented in Computer Science:

- English for communication: its goal is to develop student knowledge, abilities and skills for the interpretation and understanding of technical language associated with the specialty; this subject-area will be taught in English only.

- Information and Communication Technologies: includes necessary elements to develop knowledge, abilities and skills to prepare the expert user of these technologies. Some aspects are: hardware, software, Internet, databases, specialized systems of information and connectivity with mobile equipment.

- Computer Network: The concepts related to the latest equipment technology are integrated and are 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 to be certified, students must be able to manage constant upgrades of the network

The mid technician in computer support should be able to perform preventive and corrective maintenance of desktop computers, laptops, accessories, and servers, and manage the fundamentals of electricity and electronics as well as networking and operating systems.

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, Integral 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 assess 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.

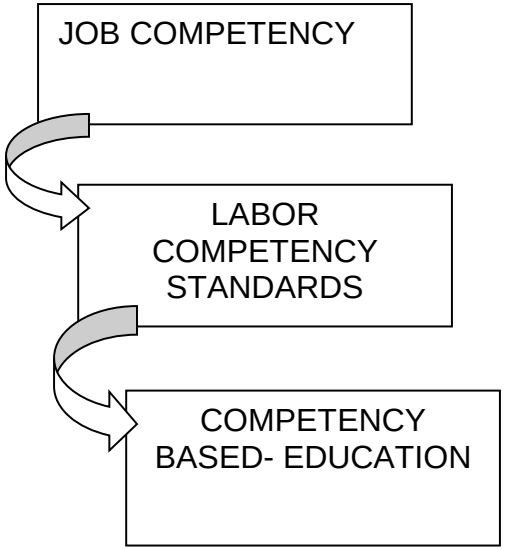
- The time allotted to practice and theory must be evenly distributed in accordance with the learning results to be developed.

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

COMPETENCY BASED EDUCATION [1]

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



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

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

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

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

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

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

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

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

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

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

ASSESSMENT GUIDELINES

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

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

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

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

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

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

---

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

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

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

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

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

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

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

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

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

TEACHERS´ PLANNING

1. ANNUAL PLAN FOR SUBJECT-AREA

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

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

Scheme for Annual Plan

ANNUAL PLAN

Technical High School: _____

Program: Information Technology Support	Subject-area:	Grade: TWELFTH
Teacher:		Year:
Values and attitudes:		

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

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

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

Pedagogical Practice Plan

Technical High School:		
Sector: Commercial And Services	Program: Information Technology Support	
Subject Area:	Year:	Grade: TWELFTH
Study block:	Time:	
Purpose:		

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

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

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

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

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

TECHNICAL PROFESSIONAL PROFILE
INFORMATION TECHNOLOGY SUPPORT

- 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 Information Technology Support:

- Differentiates internal components of the laptop.
- Differentiates accessories used with laptops.
- Differentiates characteristics of several types of software used in laptops.
- Discusses health and safety measures for working with computer equipment and hand tools.
- Uses boot and recovery disks as a security measure in the process of maintaining or upgrading equipment.
- Makes a diagnostic system on laptop computers using special software.
- Distinguishes adapters used in laptops.
- Installs and configures internal components of laptops.
- Installs and configures accessories in laptops.
- Installs operating systems and software in laptops.
- Applies hygiene and safety at work for maintaining and repairing equipment
- Distinguishes internal components of monitors.
- Applies preventive measures and corrective maintenance of monitors.
- Applies preventive measures and corrective maintenance of printers.
- Applies preventive measures and corrective maintenance of scanners.
- Differentiates internal components and accessories associated with servers.
- Differentiates characteristics of software used by servers.
- Recognizes basic principles of electricity.
- Applies fundamental principles governing construction of basic electrical circuits.
- Identifes basic elements for the protection of electrical circuits.
- Uses different tools and instruments for working with electricity.

- Identifies the concepts and principles of electronics.
- Identifies characteristics and function of electronic components of computer equipment.
- Identifies characteristics and operation of electrical protection systems and power supplies.
- Applies principles of electricity and electronics in the installation of electrical protection systems and power supplies.
- Uses functions and tools available in a language of visual environment for controlling the program.
- Develops programs using modular programming elements in a language of visual environment.
- Designs the user interface using different tools.
- Creates databases and management applications, or updates them.
- Uses basic tools of specialized English for reading and interpreting technical information.
- Applies basic functions of a word processor for document preparation
- Uses the tools presented in a spreadsheet for document preparation.
- Develops databases using available tools.
- Uses applications related to using Internet and its services to search and access information. Designs websites for publishing information online.
- Makes the connection and installation of mobile devices, both independently and using computer equipment.
- Applies algorithms and structured flow diagrams on the computer as tools for logical problem solving.
- Uses symbology for the construction of algorithms and flowcharts.
- Distinguishes basic concepts related to structured programming.
- Solves problems using components involved in the development of a program.
- Builds decision blocks and conditions adapted for specific cases.
- Uses procedures and functions to solve specific problems.
- Recognizes basic elements for using specific syntax of a language-oriented to structured programming.
- Makes algorithms required to solve specific problems using available tools.

- Develops simple programs using selected structures, operators, repetitive structures and functions.
- Designs programs in a programming language containing input / output operation management.
- Illustrates the importance of safety for accident prevention.
- Applies basic rules for handling waste disposal.
- Values the importance of signaling dangerous areas and access zones.
- Applies safety rules in various activities to prevent accidents at work.
- Distinguishes causes and effects of accidents caused by fire, as well as methods of prevention in the workplace.
- Identifies agents that are exposed in the workplace associated with computer science.
- Applies a variety of techniques to prevent the negative effects of workload.
  Applies techniques to eliminate electrical hazards.
- Creates boot and recovery disks as a security measure for the process of maintaining or upgrading the equipment.
- Distinguishes adapters used in computers.
- Recognizes the components of the administrative process within the scope of work associated with the support field.
- Identifies basic elements of the accounting process applied to a microenterprise.
- Develops a business plan for a microenterprise in the area of computer support.
- Builds basic assumptions related to the work of technical computer support.
- Develops specific projects related to the computer support area.
- Discusses health and safety measures necessary for working with computer equipment and hand tools.
- Makes current status reports and diagnosis of different types of servers.
- Creates backups as a safety measure to initiate the process of maintaining or upgrading server.
- Formats and prepares hard drives of different types of server.
- Installs operating systems and specific software for different types of server.
- Identifies key elements of databases.
- Describes characteristics of different models of databases and standardization process.
- Applies elements related to information management for construction and maintenance of databases.

- Uses functions and tools available for creating and managing databases.
- Distinguishes basic safety concepts and principles in computer science.
- Discusses security in different contexts and computing environments.
- Recommends different security methods and techniques according to systems and equipment characteristics.
- Relates basic quality principles to the development of a support technician.
- Applies concepts related to customer service in performing support tasks
- Distinguishes characteristics and uses of telematic services.
- Applies basic principles for data communication and network usage.
- Distinguishes concepts associated with data transmission.
- Distinguishes basic elements of the OSI model and TCP / IP used in network construction.
- Configures devices used in networks.
- Uses the console line to implement various router configuration commands.
- Uses routing method for network devices to address network messages
- Identifies ISP services available in our country and the responsibilities of such service providers.
- Recognizes fundamental principles contained in codes and standards related to structure wiring.
- Applies technical standards in the construction and replacement of wiring systems.
- Distinguishes different operating systems according to their specifications.
- Uses operating system features for device management and for archives.
- Distinguishes characteristics of network administrator functions and of the operating system.
- Distinguishes characteristics of the major operating systems used today.

PROGRAM OBJECTIVES
INFORMATION TECHNOLOGY SUPPORT

To develop knowledge, skills and abilities in the students to enable them to:

Use specialized basic tools for reading and interpreting technical information in English
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.
Use basic tools of structured programming for solving specific problems.
Apply basic principles of electricity and electronics in the performance of their work.
Provide preventive and corrective maintenance in order to comply with technical standards:

- Personal computers.
- Laptops
- Servers and network terminals
- Accessories

Recognize and apply basic principles to access and manipulate information in the work of a support technician
Apply basic principles of data communication and computer networks in the work place.
Apply operating system fundamentals in the work place.

CURRICULAR STRUCTURE
PROGRAM
INFORMATION TECHNOLOGY SUPPORT

SUB-ÁREA	X	XI	XII
Information and Communication Technologies	6		
Programación	8		
Computer Maintenance	8	10	8
English for Communication	2	2	2
Fundamentos de Electricidad y Electrónica		4	
Data Management		8	
Computer Networks			8
Network Operating Systems			6
TOTAL	**24**	**24**	**24**

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

CURRICULAR FRAMEWORK
INFORMATION TECHNOLOGY SUPPORT

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

SUB-AREA	UNITS IN EACH LEVEL					
	TENTH	HOURS	**ELEVENTH**	HOURS	**TWELFTH**	HOURS
Computer Maintenance 10 hours			Laptop Computers Architecture Maintenance and Upgrading of Laptop Computers Maintenance and Repair of Computer Accessories Devices Business Management Total	80 Hrs 140 Hrs 100 Hrs 80 Hrs 400 Hrs		
English For Communication 2 hours			Safe Work. Introduction to Business Activities. Complaints and Solving Problems. Regulations, Rules and Advice. Following Instructions from Manuals and Catalogs. Making Telephone Arrangements. Entertaining. Total	10 Hrs 10 Hrs 12 Hrs 12 Hrs 12 Hrs 12 Hrs 12 Hrs 80 Hrs		
Fundamentos de Electricidad y Electrónica 4 horas			Principios de Electricidad Fundamentos de Electrónica Sistemas de Protección Eléctrica y Fuentes de Poder Total	60 Hrs 60 Hrs 40 Hrs 160 Hrs		
Data Management 8 hours			Databases Introduction to Programmimg in a Visual Environment Computer Security Quality Culture Total	80 Hrs 120 Hrs 48 Hrs 72 Hrs 320 Hrs		

SUB-AREA	UNITS IN EACH LEVEL					
	TENTH	HOURS	**ELEVENTH**	HOURS	**TWELFTH**	HOURS
Computer Maintenance 8 hours					Client Servers Architecture Server Maintenance and Upgrade Total	48 Hrs 152 Hrs 200 Hrs
English For Communication 2 hours					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
Computer Networks 8 hours					Structured Wiring Local Area Networks Physical Network Installation Total	48 Hrs 72 Hrs 80 Hrs 200 Hrs
Network Operating Systems 6 hours					Operating Systems Installation and Configuration of Operating Systems Total	60 Hrs 90 Hrs 150 Hrs

CURRICULAR MAP
INFORMATION TECHNOLOGY SUPPORT
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. • Utilizar la simbología para la construcción de algoritmos y diagramas de flujo. • Utilizar las técnicas de diagramación en la resolución de problemas utilizando los ciclos y estructuras condicionales.
	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. • Resolver problemas utilizando estructuras repetitivas. • Utilizar procedimientos y funciones como parte de la solución de problemas específicos.
	Programación 160 horas	• Utilizar la sintaxis de programación en el desarrollo de programas en un lenguaje específico. • 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	Generating Economic Success 20 hours	**Cognitive Target: 7** Using appropriate language for comparing goods, discussing advertisements, describing products and your preferences.	• Discussing about advertisements from different communication media. • Comparing goods and services and explaining the reasons why I like a product. • Describing product characteristics by contrasting and comparing different goods or services. • Expanding reading skills by reading job ads from newspapers or magazines and reading formal letters of complaint. • Writing a formal letter of complaint, completing a product comparison chart and writing an advertisement.

CURRICULAR MAP
INFORMATION TECHNOLOGY SUPPORT
ELEVENTH GRADE

SUBJECT- AREA	STUDY BLOCK	LEARNING RESULTS
Computer Maintenance 400 hours	Laptop Computers Architecture 80 hours	• Differentiate the internal components of a laptop computer. • Identify the accessories used with laptop computers. • Identify special features of software to be used in laptop computers.
	Maintenance and Upgrading of Laptop Computers 140 hours	• Analyze security and hygienic measures to work with computer equipment and hand tools. • Use startup and recovery disks as a security measure to initiate the maintenance process or upgrading of the equipment. • Carry out a diagnosis of the system in laptop computers using specific software. • Distinguish different adapters used in laptop computers. • Install and / or configure internal components of the laptop computers. • Install and configure different accessories in laptop computers. • Install different operating systems and software in laptop computers.

SUBJECT- AREA	STUDY BLOCK	LEARNING RESULTS
Computer Maintenance 400 hours	Maintenance and Repair of Computer Accessories Devices 100 hours	• Apply security and hygienic norms while working on maintenance and repair of accesories. • Distinguish the internal components of different types of monitors. • Apply measures for preventive and corrective maintenance of monitors. • Distinguish the elements and components of different types of printers. • Apply measures for preventive and corrective maintenance of different types of printers. • Distinguish the elements and components of different types of scanners. • Apply measures for the preventive and corrective maintenance of different types of scanners.
	Business Management 80 hours	• Recognize the components of the administrative process in the work environment associated with information technology. • Prepare a business plan for a microcompany that will operate in the information technology area. • Use different strategies to manage and develop projects with information technology. • Apply acquired knowledge, skills, and abilities regarding support in an internship.

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.

SUB - AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Fundamentos de Electricidad y Electrónica 160 horas	Principios de Electricidad 60 horas	• Reconocer los principios básicos de la electricidad aplicados al trabajo con equipo de cómputo. • Aplicar los principios fundamentales que rigen la construcción de circuitos eléctricos básicos. • Identificar los elementos básicos para la protección de circuitos eléctricos. • Utilizar diferentes herramientas e instrumentos para el trabajo con electricidad.
	Fundamentos de Electrónica 60 horas	• Distinguir los conceptos y principios básicos de la electrónica. • Distinguir las características y funcionamiento de los diferentes componentes electrónicos que conforman el equipo de cómputo.
	Sistemas de Protección Eléctrica y Fuentes de Poder 40 horas	• Distinguir las características y funcionamiento de los sistemas de protección eléctrica y fuentes de poder. • Utilizar los principios de la electricidad y la electrónica en la instalación de fuentes de poder y sistemas de protección eléctrica.

SUBJECT- AREA	STUDY BLOCK	LEARNING RESULTS
Data Management 320 hours	Databases 80 hours	• Identify the basic elements associated with databases. • Describe characteristics of different models of databases and the standardization processes. • Apply elements related to the management of information for construction and maintenance of databases. • Use functions and tools available for creation or databases management.
	Introduction to Programming in a Visual Environment 120 hours	• Use functions and tools available in the work environment. • Use functions and tools available in a visual language environment for program control. • Develop programs using modular programming elements in a language of visual environment. • Design the user interface using different avaible tools.

SUBJECT- AREA	STUDY BLOCK	LEARNING RESULTS
Data Management 320 hours	Computer Security 48 hours	• Distinguish basic concepts associated with computer security. • Analyze security in computer contexts and environments. • Recommend security methods and techniques according to systems and equipment characteristics.
	Quality Culture 72 hours	• Relate basic principles of quality to the development of daily tasks of a computer systems technician. • Apply concepts associated with customer service in the performance of tasks related to a computer systems technician. • Recognize the contribution of team work to achieve target goals. • Apply acquired knowledge, skills, and abilities regarding support in an internship.

CURRICULAR MAP
INFORMATION TECHNOLOGY SUPPORT
TWELFTH GRADE

SUB - AREA	STUDY UNIT	LEARNING RESULTS
Computer Maintenance 200 Hours	Client Servers Architecture 48 hours	• Differentiate the internal components of servers. • Differentiate the peripheral devices associated with servers. • Differentiate particularities of types of software to be used by servers.
	Server Maintenance and Upgrade 152 hours	• Analyze the necessary security and hygienic measures to work with computer equipment and hand tools. • Prepare reports of the current state and diagnose different types of servers. • Create security backups as a measure to initiate the server maintenance or upgrade process. • Format and prepare hard disks of different types of servers. • Install different operating systems and specific software for different types of server.

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.

SUB - AREA	STUDY UNIT	LEARNING RESULTS
Computer Networks 200 Hours	Structured Wiring 48 hours	• Identify basic concepts associated with structured wiring. • Identify different kinds of cables and connectors, their characteristics, and applications. • Recognize fundamental principles in codes and regulations related to structured wiring. • Apply technical norms in the construction and replacement of wiring systems.
	Local Area Networks 72 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.

SUB - AREA	STUDY UNIT	LEARNING RESULTS
Computer Networks 200 hours	Physical Network Installation 80 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.

SUBJECT AREA	STUDY BLOCK	LEARNING RESULTS
Network Operating Systems 150 hours	Operating Systems 60 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.
	Installation and Configuration of Operating Systems 90 hours	• Distinguish main characteristics of some network operating systems. • Use the functions of input, output, and others available in the 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.

PROGRAM CONTENT

TWELFTH GRADE

SUBJECT-AREA:

COMPUTER MAINTENANCE

DESCRIPTION

The Computer Maintenance subject-area is developed in courses of 8 hours per week. A totally practical approach must be applied in this subject area so that the theory becomes a reinforcement of the practice.

- Server Architecture: introduces all the concepts, characteristics and operation of the different components that integrate the network servers

- Servers Maintenance and Upgrade: contemplates the development of knowledge, abilities, and skills to install and configure both the internal and external components associated with the servers

GENERAL OBJECTIVES

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

1. Use technical criteria effectively in order to distinguish or recommend different components of a server.

2. Apply effective procedures to maintain and upgrade the different types of servers.

DISTRIBUTION OF STUDY BLOCK

MAINTENANCE OF COMPUTER EQUIPMENT

Study blocks	Name	Time in hours	Weeks per study block
I.	Client Servers Architecture	48	6
II.	Server Maintenance and Upgrade	152	19
	TOTAL	200	25

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Client Servers Architecture
Purpose: Distinguish or effectively recommend with technical criteria the components of the servers.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly defines basic concepts related to storage devices.	Specific
Effectively differentiates each device of server components.	Specific
Accurately explains basic concepts related to server components.	Specific
Effectively describes the operation of each server component.	Specific
Rightly uses technical criteria in the selection process.	Specific
Correctly recognizes the peripheral devices.	Specific
Adequately explains the characteristics of different devices.	Specific
Effectively points out the compatibility considerations between equipment and software.	Specific
Rightly uses technical criteria for their selection and recommendation.	Specific
Correctly identifies basic concepts related to different types of software.	Specific
Correctly describes the characteristics of each type of software.	Specific
Rightly explains the software licensing process.	Specific
Correctly investigates the procedures to purchase and license software.	Specific

Competency Elements

Reference	Title of the element
1.1.	Distinguish or effectively recommend with technical criteria the components of the servers.

Performance Criteria:

1. Differentiates the internal components of servers.
2. Differentiates the peripheral devices associated with servers.
3. Differentiates the features of types of software used by servers.

Application Field:

Category	Class
Services	Provision of Technical Education Services

Performance Evidence:

1. Differentiates each device of server components.
2. Describes the operation of each server component.
3. Explains the characteristics of different devices.
4. Points out the compatibility considerations between equipment and software.
5. Explains the software licensing process.

Product Evidence:

1. Uses technical criteria in the selection process.
2. Uses technical criteria for their selection and recommendation.
3. Investigates the procedures to purchase and license software.

Knowledge Evidence:

1. Defines basic concepts related to storage devices.
2. Explains basic concepts related to server components.
3. Recognizes the peripheral devices.
4. Identifies basic concepts related to different types of software.
5. Describes the characteristics of each type of software.

Sector: Commercial and Services	Program: Information Technology Support
Subject area: Computer Maintenance	Grade: Twelfth
Study block: Client Servers Architecture	Time: 48 hours
Purpose: Distinguish or effectively recommend with technical criteria the components of the servers.	

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

1. Differentiate the internal components of servers.	• Basic Components (hardware):
	  • BIOS
	  • Memory
	  • Processor
	  • Heat sink tool or ventilator
	  • Motherboard
	  • Other storage devices
	  • Multimedia
	  • Video
	  • Sound.
		<u>Teacher:</u>
		• Defines basic concepts related to different components of the servers.
		• Explains technical characteristics of server components
		<u>Student:</u>
		• Defines basic concepts related to storage devices.
		• Differentiates each device of server components.
			• Diligence: effort carried out to obtain something individually or with the help of others.	• Differentiates the internal components of servers.

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

	• I/O Adapters and ports:
	  • Characteristics
	  • Types:
	  • Series
	  • Parallel
	  • Wireless
	  • Infrared
	  • USB
	• Modems:
	  • Characteristics
	  • Types:
	  • Internal
	  • External
	  • Speeds
	• Software and network interface cards:
	  • Characteristics
	  • Types
	• Other components:
	  • Buses
	  • Interrupters and jumpers
	  • Cables, bands and belts
	  • Wireless devices
		Teacher:
		• Describes technical characteristics of each described device.
		• Illustrates the operation of each device.
		• Differentiates the types of I/O adapters.
		Student:
		• Explains basic concepts related to server components.
		• Describes the operation of each server component.
		• Uses technical criteria in the selection process.		

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

2. Differentiate the peripheral devices associated with servers.	• Peripheral devices:
	  • Speakers, microphones and headphones
	  • Printers
	  • Scanners
	  • Digital cameras
	  • Pocket computers
	  • Cell phones
	• Technical specifications
	• Selection recommendations
		<u>Teacher:</u>
		• Defines basic concepts related to peripheral devices.
		• Describes the characteristics of different devices.
		• Points out the compatibility considerations between equipment and software.
		• Analyzes the criteria to be used for their selection.
		<u>Student:</u>
		• Recognizes the peripheral devices.
		• Explains the characteristics of different devices.
		• Points out the compatibility considerations between equipment and software.
		• Uses technical criteria for their selection and recommendation.
			• Diligence: effort carried out to obtain something individually or with the help of others.	• Differentiates the peripheral devices associated with servers.

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

3. Differentiate particularities of types of software to be used by servers.	• Basic Components (software):
	  • Operating System:
	  • Text mode
	  • Graphic mode
	  • Of the network
	  • Of application
	  • Of development
	  • Of configuration
	• Software licensing:
	  • Concept
	  • Importance
	  • Advantages
	  • Purchasing procedures
	  • Copyrights and intellectual property (Existing laws)
		<u>Teacher:</u>
		• Defines basic concepts related to different types of software.
		• Describes the characteristics of each type of software.
		• Explains the technical characteristics and applications of each type of software.
		• Illustrates the procedures to purchase and license software.
			• Diligence: effort carried out to obtain something individually or with the help of others.	• Differentiates the features of types of software used by servers.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies basic concepts related to different types of software. • Describes the characteristics of each type of software. • Explains the software licensing process. • Investigates the procedures to purchase and license software.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Client Server Architecture	PRACTICE No. 1

Purpose:

Scenario: Workshop maintenance of computer equipment	Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:

- Defines basic concepts related to different components of the servers.
- Explains technical characteristics of server components
- Describes technical characteristics of each described device.
- Illustrates the operation of each device.
- Differentiates the types of I/O adapters.
- Defines basic concepts related to peripheral devices.
- Describes the characteristics of different devices.
- Points out the compatibility considerations between equipment and software.
- Analyzes the criteria to be used for their selection.
- Defines basic concepts related to different types of software.
- Describes the characteristics of each type of software.
- Explains the technical characteristics and applications of each type of software.
- Illustrates the procedures to purchase and license software.

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 storage devices.			
Effectively differentiates each device of server components.			
Accurately explains basic concepts related to server components.			
Effectively describes the operation of each server component.			
Rightly uses technical criteria in the selection process.			
Correctly recognizes the peripheral devices.			
Adequately explains the characteristics of different devices.			
Effectively points out the compatibility considerations between equipment and software.			
Rightly uses technical criteria for their selection and recommendation.			
Correctly identifies basic concepts related to different types of software.			
Correctly describes the characteristics of each type of software.			
Rightly explains the software licensing process.			
Correctly investigates the procedures to purchase and license software.			

CRITERIA FOR COMPETENCIES ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	SUFFIENCY OF EVIDENCES
Differentiate the internal components of servers.	Differentiates the internal components of servers.	Defines basic concepts related to storage devices.	Knowledge	Correctly defines basic concepts related to storage devices.
		Differentiates each device of server components.	Performance	Effectively differentiates each device of server components.
		Explains basic concepts related to server components.	Knowledge	Accurately explains basic concepts related to server components.
		Describes the operation of each server component.	Performance	Effectively describes the operation of each server component.
		Uses technical criteria in the selection process.	Product	Rightly uses technical criteria in the selection process.

CRITERIA FOR COMPETENCIES ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	SUFFIENCY OF EVIDENCES
Differentiate the peripheral devices associated with servers.	Differentiates the peripheral devices associated with servers.	Recognizes the peripheral devices.	Knowledge	Correctly recognizes the peripheral devices.
		Explains the characteristics of different devices.	Performance	Adequately explains the characteristics of different devices.
		Points out the compatibility considerations between equipment and software.	Performance	Effectively points out the compatibility considerations between equipment and software.
		Uses technical criteria for their selection and recommendation.	Product	Rightly uses technical criteria for their selection and recommendation.
Differentiate particularities of types of software to be used by servers.	Differentiates particularities of types of software to be used by servers.	Identifies basic concepts related to different types of software.	Knowledge	Correctly identifies basic concepts related to different types of software.
		Describes the characteristics of each type of software.	Knowledge	Correctly describes the characteristics of each type of software.
		Explains the software licensing process.	Performance	Rightly explains the software licensing process.
		Investigates the procedures to purchase and license software.	Product	Correctly investigates the procedures to purchase and license software.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Server Maintenance and Upgrade
Purpose: Apply the server maintenance and upgrade procedures.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Adequately recognizes the security norms and measures to be applied in the workshop.	Specific
Correctly identifies the sources of risk.	Specific
Adequately uses the correct procedures to manipulate the equipment and tools.	Specific
Correctly applies the stipulated rules of conduct in the workshop.	Specific
Effectively recognizes the basic norms to be followed in the preliminary revision and preparation of the inventory.	Specific
Effectively prepares a preliminary report and an inventory of the system.	Specific
Efficiently uses software and tools of the system to diagnose damages without any mistake.	Specific
Adequately detects errors and damages in different systems.	Specific
Correctly uses the procedures to make backups.	Specific
Adequately applies basic norms for the security of backups.	Specific
Correctly applies basic measures for the protection of the physical systems.	Specific
Effectively recognizes the types and technical specifications of hard disks of servers.	Specific
Correctly applies the procedures to dismantle disks.	Specific
Correctly applies the procedures to format hard disks.	Specific
Effectively recognizes the security norms for the installation of operating systems and software in servers.	Specific
Clearly identifies technical requirements for the installation of operating systems and specific software.	Specific
Correctly applies procedures for the installation and configuration of operating systems and software in the server.	Specific

Competency Elements

Reference	Title of the element
1.2.	Apply the server maintenance and upgrade procedures

Performance Criteria:

1. Analyzes the necessary security and hygienic measures to work with computer equipment and hand tools.
2. Prepares reports of the current condition and diagnoses different types of servers.
3. Creates security backups as a measure to initiate the server maintenance or upgrade process.
4. Format and prepares the hard disks of different types of servers.
5. Installs different operating systems and specific software in different types of servers.

Application Field:

Category	Class
Services	Provision of Technical Education Services

Performance Evidence:

1. Uses the correct procedures to manipulate the equipment and tools.
2. Applies the stipulated rules of conduct in the workshop.
3. Uses software and tools of the system to diagnose damages without any mistake.
4. Detects errors and damages in different systems.
5. Uses the procedures to make backups.
6. Applies basic norms for the security of backups.
7. Recognizes the security norms for the installation of operating systems and software in servers.
8. Identifies technical requirements for the installation of operating systems and specific software.

Product Evidence:

1. Prepares a preliminary report and an inventory of the system.
2. Applies basic measures for the protection of the physical systems.
3. Applies the procedures to dismantle disks.
4. Applies the procedures to format hard disks.
5. Applies procedures for the installation and configuration of operating systems and software in the server.

Knowledge Evidence:

1. Recognizes the security norms and measures to be applied in the workshop.
2. Identifies the sources of risk.
3. Recognizes the basic norms to be followed in the preliminary revision and preparation of the inventory.
4. Recognizes the types and technical specifications of hard disks of servers.

Sector: Commercial and services	Program: Information Technology Support
Subject area: Computer Maintenance	Grade: Twelfth
Study Block: Server Maintenance and Upgrade	Time: 152 hours
Purpose: Apply the server maintenance and upgrade procedures.	

LEARNING RESULTS	CONTENT	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Analyze the necessary security and hygienic measures to work with computer equipment and hand tools.	• Electric risks • Sources of risk • Security measures • Hand tools • Norms to manipulate the equipment and tools • Care and storage of tools • Rules of conduct in the workshop • Actions in case of accident	Teacher: • Defines basic concepts related to security and hygiene in the workshop. • Describes security norms and measures. • Identifies the sources of risk. • Illustrates the correct procedures to manipulate the equipment and tools.	• Responsibility: awareness of the consequences of every action we execute or fail to execute.	• Analyzes the necessary security and hygienic measures to work with computer equipment and hand tools.

LEARNING RESULTS	CONTENT	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Recognizes the security norms and measures to be applied in the workshop. • Identifies the sources of risk. • Uses the correct procedures to manipulate the equipment and tools. • Applies the stipulated rules of conduct in the workshop.		

LEARNING RESULTS	CONTENT	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Prepare reports of the current state and diagnose different types of servers.	• Preliminary revision of the condition of the system • Preparation of an inventory of the components of the system • System diagnostic software	<u>Teacher:</u> • Describes the importance of executing a preliminary revision of the condition of the system and an inventory of the system. • Defines basic norms to be followed in the preliminary revision and preparation of the inventory. • Prepares a preliminary report and an inventory of the system. • Exemplifies the use of software and tools of the system to diagnose damages without any mistake.	• Responsibility: awareness of the consequences of every action we execute or fail to execute.	• Prepares reports of the current condition and diagnoses different types of servers.

LEARNING RESULTS	CONTENT	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Recognizes the basic norms to be followed in the preliminary revision and preparation of the inventory. • Prepares a preliminary report and an inventory of the system. • Uses software and tools of the system to diagnose damages without any mistake. • Detects errors and damages in different systems.		

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

3. Create security backups as a measure to initiate the server maintenance or upgrade process.	• Security Backups:
	  • Concept
	  • Characteristics
	  • Importance
	  • Types of information to be backed up
	  • Means
	  • Procedures
	• Storage of the physical systems in which the back ups are made:
	  • Security
	  • Protection against damage
		<u>Teacher:</u>
		• Defines the concepts associated with security backups.
		• Identifies the types and importance of the information to be backed up.
		• Demonstrates the basic measures for the protection of the physical systems.
		<u>Student:</u>
		• Uses the procedures to make backups.
		• Applies basic norms for the security of backups.
		• Applies basic measures for the protection of the physical systems.
			• Responsibility: awareness of the consequences of every action we execute or fail to execute.	• Creates security backups as a measure to initiate the server maintenance or upgrade process.

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

4. Format and prepare hard disks of different types of servers.	• Hard disks:
	  • Types
	  • Technical specifications
	  • Special considerations
	  • Installation or dismantling
	• Formatting:
	  • Security norms
	  • Methods and Procedures
	  • Partitions
		<u>Teacher:</u>
		• Describes the types and technical specifications of hard disks of servers.
		• Illustrates the procedures to dismantle disks.
		• Demonstrates the procedures to format hard disks.
		<u>Student:</u>
		• Recognizes the types and technical specifications of hard disks of servers.
		• Applies the procedures to dismantle disks.
		• Applies the procedures to format hard disks.
			• Responsibility: awareness of the consequences of every action we execute or fail to execute.	• Format and prepares the hard disks of different types of servers.

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

5. Install different operating systems and specific software in different types of servers.	• Operating systems:
	  • Security norms for installation
	  • Technical requirements
	  • Platform requirements
	  • System installation
	  • Configuration of internal components
	  • Configuration of peripheral devices
		<u>Teacher:</u>
		• Mentions security norms for the installation of operating systems and software in servers.
		• Identifies technical requirements for the installation of the operating systems and specific software.
		• Describes the procedures for the installation and configuration of different operating systems and software in the server.
			• Responsibility: awareness of the consequences of every action we execute or fail to execute.	• Installs different operating systems and specific software in different types of servers.

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

	• Specific software:
	  • Security norms for installation
	  • Technical requirements
	  • Platform requirements
	  • Installation of software
	  • Options to share resources and information
		Student:
		• Recognizes the security norms for the installation of operating systems and software in servers.
		• Identifies technical requirements for the installation of operating systems and specific software.
		• Applies procedures for the installation and configuration of operating systems and software in the server.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Server Maintenance and Upgrade	PRACTICE No. 1

Purpose:

Scenario: Workshop maintenance of computer equipment	Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures
Teacher: • Defines basic concepts related to security and hygiene in the workshop. • Describes security norms and measures. • Identifies the sources of risk. • Illustrates the correct procedures to manipulate the equipment and tools • Describes the importance of executing a preliminary revision of the condition of the system and an inventory of the system. • Defines basic norms to be followed in the preliminary revision and preparation of the inventory. • Prepares a preliminary report and an inventory of the system. • Exemplifies the use of software and tools of the system to diagnose damages without any mistake. • Defines the concepts associated with security backups. • Identifies the types and importance of the information to be backed up. • Demonstrates the basic measures for the protection of the physical systems. • Describes the types and technical specifications of hard disks of servers. • Illustrates the procedures to dismantle disks. • Demonstrates the procedures to format hard disks. • Mentions security norms for the installation of operating systems and software in servers. • Identifies technical requirements for the installation of the operating systems and specific software. • Describes the procedures for the installation and configuration of different operating systems and software in the server.

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 recognizes the security norms and measures to be applied in the workshop.			
Correctly identifies the sources of risk.			
Adequately uses the correct procedures to manipulate the equipment and tools.			
Correctly applies the stipulated rules of conduct in the workshop.			
Effectively recognizes the basic norms to be followed in the preliminary revision and preparation of the inventory.			
Effectively prepares a preliminary report and an inventory of the system.			
Efficiently uses software and tools of the system to diagnose damages without any mistake.			
Adequately detects errors and damages in different systems.			
Correctly uses the procedures to make backups.			
Adequately applies basic norms for the security of backups.			
Correctly applies basic measures for the protection of the physical systems.			
Effectively recognizes the types and technical specifications of hard disks of servers.			
Correctly applies the procedures to dismantle disks.			
Correctly applies the procedures to format hard disks.			
Effectively recognizes the security norms for the installation of operating systems and software in servers.			

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Clearly identifies technical requirements for the installation of operating systems and specific software.			
Correctly applies procedures for the installation and configuration of operating systems and software in the server.			

OBSERVATIONS:

CRITERIA FOR COMPETENCIES ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	SUFFIENCY OF EVIDENCES
Analyze the necessary security and hygienic measures to work with computer equipment and hand tools.	Analyzes the necessary security and hygienic measures to work with computer equipment and hand tools.	Recognizes the security norms and measures to be applied in the workshop.	Knowledge	Adequately recognizes the security norms and measures to be applied in the workshop.
		Identifies the sources of risk.	Knowledge	Correctly identifies the sources of risk.
		Uses the correct procedures to manipulate the equipment and tools.	Performance	Adequately uses the correct procedures to manipulate the equipment and tools.
		Applies the stipulated rules of conduct in the workshop.	Performance	Correctly applies the stipulated rules of conduct in the workshop.

CRITERIA FOR COMPETENCIES ASSESSMENT

EARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	SUFFIENCY OF EVIDENCES
Prepare reports of the current state and diagnose different types of servers.	Prepares reports of the current state and diagnose different types of servers.	Recognizes the basic norms to be followed in the preliminary revision and preparation of the inventory.	Knowledge	Effectively recognizes the basic norms to be followed in the preliminary revision and preparation of the inventory.
		Prepares a preliminary report and an inventory of the system.	Product	Effectively prepares a preliminary report and an inventory of the system.
		Uses software and tools of the system to diagnose damages without any mistake.	Performance	Efficiently uses software and tools of the system to diagnose damages without any mistake.
		Detects errors and damages in different systems.	Performance	Adequately detects errors and damages in different systems.
Create security backups as a measure to initiate the server maintenance or upgrade process.	Creates security backups as a measure to initiate the server maintenance or upgrade process.	Uses the procedures to make backups.	Performance	Correctly uses the procedures to make backups.
		Applies basic norms for the security of backups.	Performance	Adequately applies basic norms for the security of backups.
		Applies basic measures for the protection of the physical systems.	Product	Correctly applies basic measures for the protection of the physical systems.

CRITERIA FOR COMPETENCIES ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	SUFFIENCY OF EVIDENCES
Format and prepare hard disks of different types of servers.	Formats and prepare hard disks of different types of servers.	Recognizes the types and technical specifications of hard disks of servers.	Knowledge	Effectively recognizes the types and technical specifications of hard disks of servers.
		Applies the procedures to dismantle disks.	Product	Correctly applies the procedures to dismantle disks.
		Applies the procedures to format hard disks.	Product	Correctly applies the procedures to format hard disks.
Install different operating systems and specific software in different types of servers.	Installs different operating systems and specific software in different types of servers.	Recognizes the security norms for the installation of operating systems and software in servers.	Performance	Effectively recognizes the security norms for the installation of operating systems and software in servers.
		Identifies technical requirements for the installation of operating systems and specific software.	Performance	Clearly identifies technical requirements for the installation of operating systems and specific software.
		Applies procedures for the installation and configuration of operating systems and software in the server.	Product	Correctly applies procedures for the installation and configuration of operating systems and software in the server.

SUBJECT– AREA: ENGLISH FOR COMMUNICATION

TWELFTH LEVEL

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

DISTRIBUTION OF UNITS
ENGLISH FOR COMMUNICATION

Twelfth Level

Units	Name	Time in hours	Weeks per study block
1	Day to day work	10 hrs	5 weeks
2	Customer service	10 hrs	5 weeks
3	Stand for excellence	10 hrs	5 weeks
4	Travel	10 hrs	5 weeks
5	Building an outstanding future career	10 hrs	5 weeks
	Total	50 hrs	25 weeks

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

SUBJECT – AREA: COMPUTER NETWORKS

SUBJECT – AREA: COMPUTER NETWORKS
D E S C R I P T I O N

The Information Technology Support must have the basic knowledge related to the structure and operation of Computer Networks; such as the main theoretical and methodological aspects of data transfer, use of protocols, capacities and configurations.

The subject-area is divided into three study units: Structured Wiring, Local Area Networks and Physical Network Installation.

GENERAL OBJECTIVES

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

- Design different programs using tools and structures available in a language for visual environments
- Use basic concepts, applications, and elements related to databases
- Identify the concepts, characteristics, and applications of the information systems
- Distinguish the fundamental concepts and principles of security in the field of information systems

DISTRIBUTION OF STUDY BLOCK
COMPUTER NETWORKS

Study block	Name	Time in hours	Weeks per study block
I.	Structured Wiring	48	6
II.	Local Area Networks	72	9
III.	Physical Network Installation	80	10
	TOTAL	200	25

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
3 – 1	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: Information Technology Support
Subject area: Computer Networks	Grade: Twelfth
Study block: Structured Wiring	Time: 48 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 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
		<u>Teacher:</u>
		• 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
		<u>Teacher:</u>
		• 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
		<u>Student:</u>
		• 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 of 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: 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 the 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 the 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: Information Technology Support
Subject area: Computer Networks	Grade: Twelfth
Study block: Local Area Networks	Time: 72 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
		<u>Teacher:</u>
		• 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
	  • Tranlation of directions according to PAT port
		<u>Teacher:</u>
		• 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	<u>Teacher:</u> • 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. • Illustrate 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
		<u>Teacher:</u>
		• 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
		<u>Teacher:</u>
		• Explains the concept and characteristics of TCP/IP.
		• Illustrates the use of DNS services and support for HTTP, FTP, SMTP, POP3, and IMPAP.
		• Illustrates ISP security using data encryption.
		• Describes the 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 the 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 the 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 internet work.			
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 FORCOMPETENCY 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 the use of security copies for disaster recovery.

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
3 – 3	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: Information Technology Support
Subject area: Computer Networks	Grade: Twelfth
Study block: Physical Network Installation	Time: 80 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	<u>Teacher:</u> • 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	<u>Teacher:</u> • 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
		<u>Teacher:</u>
		• 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	<u>Teacher:</u> • 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.		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Physical Network 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.			

OBSERVATIONS:

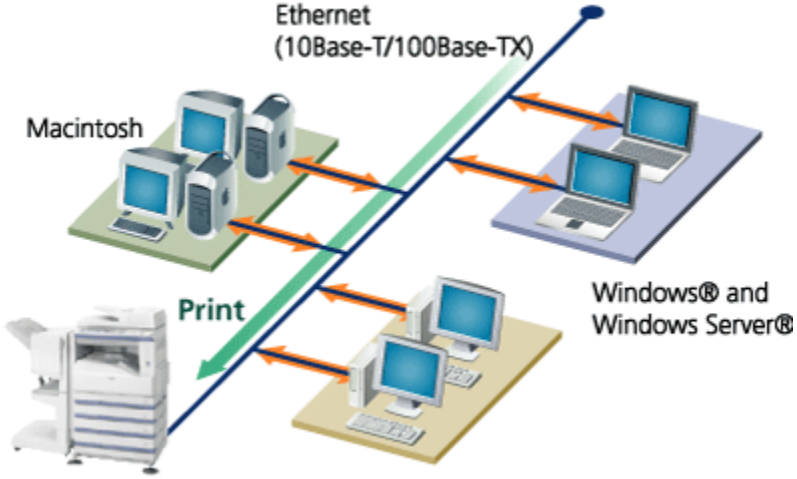
CRITERIA FOR COMPETENCY ASSESSMENT

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 and configures 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 the 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.

SUBJECT AREA: NETWORK OPERATING SYSTEMS



SUBJECT AREA: NETWORK OPERATING SYSTEMS

D E S C R I P T I O N

The Network Operating Systems subject area will be developed during a period of 6 hours per week. ***This subject area must be developed in a totally practical manner so that the theory becomes a support to the practice.***

- Operating systems.
- Installation and configuration of the operating systems.

GENERAL LEARNING RESULTS

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

1. Select different operating systems based on their technical characteristics.
2. Carry out the installation and configuration of different operating systems both in servers as well as in the terminals of the network.

DISTRIBUTION OF STUDY BLOCK

NETWORK OPERATING SYSTEMS

Study blocks	Name	Time in hours	Weeks per study block
I.	Operating Systems	60	7
II.	Installation and Configuration of Operating System	90	9
	TOTAL	150	25

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

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

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

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

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

Competency Elements

Reference	Title of the element
4-1	Select different operating systems for their technical characteristics.

Performance criteria:

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

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

Application Field:

Category	Class
Services	Provision of Technical Education Services

Performance Evidence:

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

Knowledge Evidence:

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

Product Evidence:

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

Sector: Commercial and Services	Program: Information Technology Support
Subject area: Network Operating Systems	Grade: Twelfth
Study block: Operating Systems	Time: 60 hours
Purpose: Select different operating systems for their technical characteristics.	

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Operating Systems	PRACTICE No. 1

Purpose:

Scenario: Classroom	Duration:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

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

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

RECOMMENDED CHECKLIST	Date:

Student's name:	

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

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

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

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

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

CRITERIA FOR COMPETENCY ASSESSMENT

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

CRITERIA FOR COMPETENCY ASSESSMENT

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

CRITERIA FOR COMPETENCY ASSESSMENT

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

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

CRITERIA FOR COMPETENCY ASSESSMENT

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

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

CRITERIA FOR COMPETENCY ASSESSMENT

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

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Installation and Configuration of Operating System
Purpose: Efficient user in the network operating system environment.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly identifies concepts related to the network operating system.	Specific
Effectively recognizes differences between existing versions of each network operating system.	Specific
Adequately explains decision making-criteria for choosing one version.	Specific
Effectively indicates the elements integrating a network.	Specific
Effectively identifies elements windows work.	Specific
Effectively recognizes characteristics and applications of functions and tools.	Specific
Correctly creates direct access to programs.	Specific
Correctly uses the logon and logoff commands in the environment of the operating system and tools available.	Specific
Correctly identifies configuration accessories and elements.	Specific
Effectively explains characteristics and applications of each one.	Specific
Effectively recognizes the use of each element of the network operating system.	Specific
Effectively experiments using each element.	Specific
Effectively identifies tasks associated with Microsoft windows file management.	Specific
Correctly recognizes procedures to track down and manage files.	Specific
Correctly carries out various operations for file management.	Specific
Correctly manipulates files using available tools.	Specific
Correctly identifies tasks associated with user´s administration in the system.	Specific
Effectively explains procedures for user's administration.	Specific

Title	Classification
Correctly carries out operations for handling aspects related to users.	Specific
Correctly manages user accounts and properties.	Specific
Effectively identifies tasks associated with security, management of backups, and shared resources.	Specific
Correctly explains procedures for security management, backups, and shared resources.	Specific
Adequately uses security operations and shared resources management.	Specific

Competency Elements

Reference	Title of the element
4 - 2	Efficient user in the network operating system environment.

Performance criteria:

1. Distinguishes the main characteristics of some network operating systems.
2. Uses the functions of input, output, and others available in the interface of some network operating systems.
3. Uses accessories and basic configuration of the network operating system.
4. Uses basic tools of some operating systems for the user´s administration.
5. Uses the security and auditing elements of network operating systems.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance evidence:

1. Explains decision- making criteria for choosing one version.
2. Indicates the elements integrating a network.
3. Recognizes characteristics and applications of functions and tools.
4. Explains characteristics and applications of each one.
5. Recognizes the use of each element of the network operating system.
6. Experiments using each element.

7. Recognizes procedures to track down and manage files.
8. Carries out various operations for file management.
9. Explains procedures for user's administration.
10. Carries out operations for handling aspects related to users.
11. Explains procedures for security management, back-ups, and shared resources.

Product evidence:

1. Creates direct access to programs.
2. Uses the logon and logoff commands in the environment of the operating system and tools available.
3. Manipulates files using available tools.
4. Manages user accounts and properties.
5. Uses security operations and shared resources management.

Knowledge evidence:

1. Identifies concepts related to the network operating system.
2. Recognizes differences between existing versions of each network operating system.
3. Identifies elements of windows work.
4. Identifies configuration accessories and elements.
5. Identifies tasks associated with Microsoft Windows file management.
6. Identifies tasks associated with user´s administration in the system.
7. Identifies tasks associated with security, management of backups, and shared resources.

Sector: Commercial and Services	Program: Information Technology Support
Subject Area: Network Operating Systems	Grade: Twelfth
Study Block: Installation and Configuration of Operating System	Time: 90 hours
Purpose: Efficient user in the network operating system environment.	

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

1. Distinguish main characteristics of some network operating systems.	• Network Operating Systems:
	  • Concept
	  • Characteristics
	  • Requirements
	  • Applications, advantages, and disadvantages
	  • Differences between versions
	  • Criteria decision-making for choosing one existing version
	• Network Elements
	• Groups and domains in a network
	• Network customers
		<u>Teacher:</u>
		• Defines concepts related to the network operating system
		• Discusses criteria for decision-making among one of the existing systems.
		• Illustrates elements that integrate a network.
		• Illustrates the use of groups and domains.
			Awareness of our strengths and weaknesses.	• Distinguishes main characteristics of some network operating systems.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies concepts related to the network operating system. • Recognizes differences between existing versions of each network operating system. • Explains decision-making criteria for choosing one version. • Indicates the elements integrating a network.		

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

2. Use the functions of input, output, and others available in the interface of some network operating systems.	• Basic elements in windows work:
	  • Toolbar
	  • Menus
	  • Functions and work tool
	  • Direct connections to programs
	  • Work windows
	  • Dialogue chart
	  • Input and output system
	  • Help
		<u>Teacher:</u>
		• Defines elements of windows work.
		• Describes characteristics and applications of functions and tools.
		• Illustrates the use and creation of direct access.
		• Shows the use of the logon and logoff commands in the environment of operating system.
			• Awareness of our strengths and weaknesses.	• Uses the functions of input, output, and others available in the interface of some network operating systems.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies elements of windows work. • Recognizes characteristics and applications of functions and tools. • Creates direct access to programs. • Uses the logon and logoff commands in the environment of the operating system and tools available.		

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

3. Use accessories and basic configuration of the network operating system.	• Available accessories, functions, or tools.
	• Basic configuration:
	  • Graphic resolution of the monitor
	  • Keyboard language
	  • Configurations of a regional order (date formats, hour, and numbers)
	  • Computer storage units or devices.
	  • Information of the system
	  • Version of the system
	  • Computer memory
		<u>Teacher:</u>
		• Lists configuration accessories and elements.
		• Describes characteristics and applications of each accessory.
		• Shows the use of each element.
		• Experiments using each element.
		<u>Student:</u>
		• Identifies configuration accessories and elements.
		• Explains characteristics and applications of each one.
		• Recognizes the use of each element of the network operating system.
		• Experiments using each element.
			• Humility: Awareness of our strengths and weaknesses.	• Uses accessories and basic configuration of the network operating system.

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

	• Execution of programs:
	  • Multitask concept
	  • Locate files or directories
	  • Basic operations of file management
	  • Manipulation of files
	  • Recovery of deleted files
	  • Transfer and updating files modified outside the station
		<u>Teacher:</u>
		• Identifies tasks associated with Microsoft Windows file management.
		• Reviews procedures to track down and manage files.
		• Shows various operations for file management.
		• Manipulates files using available tools.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies tasks associated with Microsoft Windows file management. • Recognizes procedures to track down and manage files. • Carries out various operations for file management. • Manipulates files using available tools.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
4. Use basic tools of some operating systems for the user´s administration.	• Role of the user within the system • Creation of user accounts and assignment of basic properties • Options in the user management menu	<u>Teacher:</u> • Identifies tasks associated with the system's user´s management. • Reviews procedures for user's administration. • Shows operations for handling aspects related to users. • Manages user accounts and properties.	• Humility: Awareness of our strengths and weaknesses.	• Uses basic tools of some operating systems for the user´s administration.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		Student: • Identifies tasks associated with user´s administration in the system. • Explains procedures for user's administration. • Carries out operations for handling aspects related to users. • Manages user accounts and properties.		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
5. Use security and auditing elements of network operating systems.	• Security and auditing • Backups • Shared resources • Permits for shared resource storage • Ease and procedure to create network units • Install and share printers	Teacher: • Identifies tasks associated with security, handling of backups, and shared resources. • Shows related operations. • Uses security, auditing and back-ups. Student: • Identifies tasks associated with security, management of backups, and shared resources. • Explains procedures for security management, back-ups, and shared resources. • Uses security operations and shared resources management.	• Awareness of who we are, of our strengths and weaknesses.	• Uses the security and auditing elements of network operating systems.

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Installation and Configuration of Operating System	PRACTICE No. 1

Purpose:

Scenario: Classroom	Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures
Teacher: • Defines concepts related to the network operating system • Discusses criteria for decision- making among one of the existing systems. • Illustrates elements that integrate a network. • Illustrates the use of groups and domains. • Defines elements of windows work. • Describes characteristics and applications of functions and tools. • Illustrates the use and creation of direct access. • Shows the use of the logon and logoff commands in the environment operating system. • Lists configuration accessories and elements. • Describes characteristics and applications of each accessory. • Shows the use of each element. • Experiments using each element. • Identifies tasks associated with Microsoft Windows file management. • Reviews procedures to track down and manage files. • Shows various operations for file management. • Manipulates files using available tools. • Identifies tasks associated with the system's user´s management. • Reviews procedures for user's administration. • Shows operations for handling aspects related to users. • Manages user accounts and properties. • Identifies tasks associated with security, handling of backups, and shared resources. • Shows related operations. • Uses security, auditing and backups.

RECOMMENDED CHECKLIST	Date:

Student's name:	

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

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Correctly identifies concepts related to the network operating system.			
Effectively recognizes differences between existing versions of each network operating system.			
Adequately explains decision- making criteria for choosing one version.			
Effectively indicates the elements integrating a network.			
Effectively identifies elements windows work.			
Effectively recognizes characteristics and applications of functions and tools.			
Correctly creates direct access to programs.			
Correctly uses the logon and logoff commands in the environment of the operating system and tools available.			
Correctly identifies configuration accessories and elements.			
Effectively explains characteristics and applications of each one.			
Effectively recognizes the use of each element of the network operating system.			
Effectively experiments using each element.			
Effectively identifies tasks associated with Microsoft windows file management.			
Correctly recognizes procedures to track down and manage files.			
Correctly carries out various operations for file management.			
Correctly manipulates files using available tools.			
Correctly identifies tasks associated with user´s administration in the system.			
Effectively explains procedures for user's administration.			

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Correctly carries out operations for handling aspects related to users.			
Correctly manages user accounts and properties.			
Effectively identifies tasks associated with security, management of backups, and shared resources.			
Correctly explains procedures for security management, backups, and shared resources.			
Adequately uses security operations and shared resources management.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Distinguish the main characteristics of some network operating systems.	Distinguishes the main characteristics of some network operating systems.	Identifies concepts related to the network operating system.	Knowledge	Correctly identifies concepts related to the network operating system.
		Recognizes differences between existing versions of each network operating system.	Knowledge	Effectively recognizes differences between existing versions of each network operating system.
		Explains decision-making criteria for choosing one version.	Performance	Adequately explains decision-making criteria for hoosing one version.
		Indicates the elements integrating a network.	Performance	Effectively indicates the elements integrating a network.
Use the functions of input, output, and others available in the interface of some network operating systems.	Uses the functions of input, output, and others available in the interface of some network operating systems.	Identifies elements ofwindows work.	Knowledge	Effectively identifies elements of windows work.
		Recognizes characteristics and applications of functions and tools.	Performance	Effectively recognizes characteristics and applications of functions and tools.
		Creates direct access to programs.	Product	Correctly creates direct access to programs.
		Uses the logon and logoff commands in the environment of the operating system and tools available.	Product	Correctly uses the logon and logoff commands in the environment of the operating system and tools available.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use accessories and basic configuration of the network operating system.	Uses accessories and basic configuration of the network operating system.	Identifies configuration accessories and elements.	Knowledge	Correctly identifies configuration accessories and elements.
		Explains characteristics and applications of each one.	Performance	Effectively explains characteristics and applications of each one.
		Recognizes the use of each element of the network operating system.	Performance	Effectively recognizes the use of each element of the network operating system.
		Experiments using each element.	Performance	Effectively experiments using each element.
		Identifies tasks associated with Microsoft Windows file management.	Knowledge	Effectively identifies tasks associated with Microsoft windows file management.
		Recognizes procedures to track down and manage files.	Performance	Correctly recognizes procedures to track down and manage files.
		Carries out various operations for file management.	Performance	Correctly carries out various operations for file management.
		Manipulates files using available tools.	Product	Correctly manipulates files using available tools.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use basic tools of some operating systems for the user´s administration.	Uses basic tools of some operating systems for the user´s administration.	Identifies tasks associated with user´s administration in the system.	knowledge	Correctly identifies tasks associated with user´s administration in the system.
		Explains procedures for user's administration.	Performance	Effectively explains procedures for user's administration.
		Carries out operations for handling aspects related to users.	Performance	Correctly carries out operations for handling aspects related to users.
		Manages user accounts and properties.	Product	Correctly manages user accounts and properties.
Use security and auditing elements of network operating systems.	Uses security and auditing elements of network operating systems.	Identifies tasks associated with security, management of backups, and shared resources.	Knowledge	Effectively identifies tasks associated with security, management of backups, and shared resources.
		Explains procedures for security management, back-ups, and shared resources.	Performance	Correctly explains procedures for security management, backups, and shared resources.
		Uses security operations and shared resources management.	Product	Adequately uses security operations and shared resources management.

BIBLIOGRAPHY

Armstrong, Thomas. ***7 Kinds of Smart: Identifying and developing your many Intelligences.*** New York: Dutton /Signet,
2000.

Bain, Richard. ***Reflections: Talking about Language.*** St. Edmundsbury Press. London. 1999

Brown, Douglas. ***Teaching by Principles. An Interactive Approach to Language Pedagogy.*** Longman. 2000

Brumfit, C.J y K. Johnson (eds.) ***The Communicative Approach to Language Teaching.*** Oxford University Press. 2000

Campbell, Linda, Bruce Campbell, and Dee Dickinson. ***Teaching and Learning Through Multiple Intelligences.*** Tucson, AZ
: Zephyr Press, 2000.

Campbell, Bruce. ***Multiple Intelligences Handbook.*** Tucson, AZ : Zephyr Press, 2000.

Campos, F & Víquez O. ***102 Communicative Activities.***

Dudley-Evans, T., & St John, M.. ***Developments in ESP: A multi-disciplinary approach.*** Cambridge: Cambridge University Press. 1998

Forstrom J, Vargo M, Pitt, M & Valsco S. ***Excellent English 1 : Language Skills for Success:*** Mc Graw Hill, 2008

Forstrom J, Vargo M, Pitt, M & Valsco S. ***Excellent English 2 : Language Skills for Success:*** Mc Graw Hill, 2008

Forstrom J, Vargo M, Pitt, M & Valsco S. ***Excellent English 3 : Language Skills for Success:*** Mc Graw Hill, 2008

Forstrom J, Vargo M, Pitt, M & Valsco S. ***Excellent English 4 : Language Skills for Success:*** Mc Graw Hill, 2008

Gardner, Howard. ***Frames of Mind : The theory of Multiple Intelligences.*** New York : Basic Books, 1998.

Gardner, Howard ***Multiple Intelligences: The Theory in Practice.*** New York: Basic Books, 2000.

Gatehouse, Kristen. Key Issues in English for Specific Purposes (ESP) Curriculum Development. ***The Internet TESL Journal, Vol. VII, No. 10,*** October 2001

Haggerty, Brian. ***Nurturing Intelligences.*** Menlo Park, CA : Addison Wesley, 2000

Harmer, Jeremy. ***The Practice of English Language Teaching***. Longman Handbook for Language Teachers. 2000.

Johns, A., & Dudley-Evans, T. English for Specific Purposes: International in scope, specific in purpose. ***TESOL Quarterly,*** **2**. 1991

Jones, G. ESP textbooks: Do they really exist? ***English for Specific Purposes, 9,*** 1990

Larsen- Freeman, Diane***. Techniques and Principles in Language Teaching***. Oxford Univesity Press. 2000.

Lazear, David. ***Seven Ways of Knowing : Teaching for Multiple Intelligences.*** Palatine, I L: Skylight Pubs.,2001.
Littlewood, W.T. ***Communicative Language Teaching.*** Cambridge University Press. 2000.
Ministerio de Educación Pública. ***Programas de Inglés I y II Ciclos.*** Costa Rica: 2005.
Ministerio de Educación Pública. ***Programas de Inglés III Ciclo y Ed. Diversificada.*** Costa Rica: 2005.
Ministerio de Educación Pública. ***Subject area de Inglés Conversacional del programa de Ejecutivo para Centros de Servicio.*** Costa Rica: 2006.
Nunan, D. ***Teacher as curriculum developer: An investigation of curriculum processes within the Adult Migrant Education Program***. South Australia: National Curriculum Resource Centre. 2000
Nunan, D. (Ed.). ***Collaborative language learning and teaching***. New York: Cambridge University Press. 1995
Pauline Robinson. ***ESP Today: A Practitioner´s Guide.*** Prentice Hall, 1991
Richards, Jack and S. Rodgers. ***Approaches and Methods in Language Teaching***. Cambridge, London 2005.
Terroux Georges and Woods Howard. ***Teaching English in a World at Peace. Professional Handbook.*** McGill University.
1990.
White, Ronald V.***New Ways in Teaching Writing.*** Teachers of English to Speakers of Other Languages, Inc: 1995
White, Ronald V.***New Ways in Teaching Speaking.*** Teachers of English to Speakers of Other Languages, Inc: 1995
White, Ronald V.***New Ways in Teaching Reading.*** Teachers of English to Speakers of Other Languages, Inc: 1995
White, Ronald V. ***New Ways in Teaching Reading.*** TESOL:1995
White, Ronald V. ***New Ways in Teaching Writing.*** TESOL:1995
Acuña, Luis A. (1990). Herramientas en programación en Turbo Pascal para PC3. Costa Rica : EDITORIAL TECNOLOGICA DE COSTA RICA.
Aguero, Ulises. (1995). Programación con diagramas estructurados. Costa Rica: EDITORIAL TECNOLOGICA DE COSTA RICA
Armstrong, Thomas. (2000). 7 Kinds of Smart: Identifying and developing your many Intelligences. New York: Dutton /Signet.
Bain, Richard. (1999). Reflections: Talking about Language. St. Edmundsbury Press. London.
Black, Uyless (1990). Redes de Computadoras, normas e interfaces. México:Macrobit.
Brey, Barry B. (1996). Los microprocesadores Intel 8086/8088, 80186,80286,80386 y 80486 México:Prentice Hall.
Brumfit, C.J y K. Johnson (eds.) (2000).The Communicative Approach to Language Teaching. Oxford University Press.
Campbell, Bruce. (2000). Multiple Intelligences Handbook. Tucson, AZ : Zephyr Press.

Campbell, Linda, Bruce Campbell, and Dee Dickinson. (2000). Teaching and Learning Through Multiple Intelligences. Tucson, AZ : Zephyr Press.
Castro de Bravo, Bertha. (1980). Technical English For Business. México: Editorial MCGRAW-HILL.
Centro de investigación y Perfeccionamiento para Educación Técnica (CIPET). (1981). Seguridad e Higiene Ocupacional. Costa Rica.
Clerc J.M. (1987). Introducción a las condiciones y medio ambiente de trabajo OIT.
Consejo Salud Ocupacional, Ministerio de Educación Pública. (1993). Antología Salud Ocupacional. Costa Rica.
Dale, Neell y Lilly, Susan. (1986). Pascal y estructura de datos. España: Editorial MCGRAW-HILL.
Di Mare Mota, Cecilia. (1994). La formación y la vivencia de los valores en las Escuelas Costarricenses. San José, Costa Rica. Litográficos Profesionales S.A.
Dooley, Brian J. (1995). El camino fácil a Windows. México: Editorial MCGRAW-HILL.
Dudley-Evans, T., & St John, M. (1998). Developments in ESP: A multi-disciplinary approach. Cambridge: Cambridge University Press.
Freedman, Alan. (1995). Diccionario de computación Inglés/Español - Español/Inglés. México: Editorial MCGRAW-HILL.
Freedman, Alan. (1995). Diccionario de computación. México: Editorial MCGRAW-HILL.
Gardner, Howard (2000). Multiple Intelligences: The Theory in Practice. New York: Basic Books.
Gardner, Howard. (1998). Frames of Mind : The theory of Multiple Intelligences. New York : Basic Books.
Gatehouse, Kristen. (2001). Key Issues in English for Specific Purposes (ESP) Curriculum Development. The Internet TESL Journal, Vol. VII, No. 10, October.
Gottfried, Byron S. (1986). Programación Pascal. España: Editorial MCGRAW-HILL.
Haggerty, Brian. (2000). Nurturing Intelligences. Menlo Park, CA : Addison Wesley.
Hahn, Harley. (1995). Unix sin fronteras. México: Editorial MCGRAW-HILL.
Harmer, Jeremy. (2000). The Practice of English Language Teaching. Longman Handbook for Language Teachers.
Helson, Stphen. (1995). Referencia rápida de MS Power Point 4.0 P/Win. México: Editorial MCGRAW-HILL.
Howe, Rogu S, y otros. (1994). Ponga la calidad a Prueba. México: Editorial MCGRAW-HILL.
Jamsa, Pris. (1995). La magia de multimedia. México: Editorial MCGRAW-HILL.
Johns, A., & Dudley-Evans, T. (1991). English for Specific Purposes: International in scope, specific in purpose. TESOL Quarterly, 25, 297-314.
Jojanes Aguilar, Luis. (1990). Fundamentos de programación. México: Editorial MCGRAW-HILL.
Jojanes Aguilar, Luis. (1995). Turbo Pascal 7.0 manual de bolsillo. México: Editorial MCGRAW-HILL.

Jojanes Aguilar, Luis. (1995). Pascal 55, 6.0 y 7.0. México: Editorial Mc. GRAW-HILL.
Jones, G. (1990). ESP textbooks: Do they really exist? English for Specific Purposes, 9, 89-93.
Krol, Ed. (1995). Conéctate al Mundo de Internet. México: Editorial MCGRAW-HILL.
Larsen- Freeman, Diane. (2000). Techniques and Principles in Language Teaching. Oxford Univesity Press.
Lasijani L. (1995). Realidad virtual. México: Editorial MCGRAW-HILL.
Lazear, David. (2001). Seven Ways of Knowing : Teaching for Multiple Intelligences. Palatine, I L: Skylight Pubs.
Letayf Acar, Jorge y Carlos González González. (1994). Seguridad, Higiene y Control Ambiental. México: Editorial MCGRAW-HILL.
Levi, Gutiérrez, Guillermo. (1993). Elementos de computación. México: Editorial MCGRAW-HILL, 1993.
Littlewood, W.T. (2000). Communicative Language Teaching. Cambridge University Press.
Long Long. (1990). Introducción a las computadoras y al Procesamiento de Información. II Edición. México D. F: Editorial MCGRAW-HILL.
Manuales Editados Por Bosland Internacional para Turbo Pascal Versiones 5.0, 6.0 y 7.0.
Methods in Language Teaching. (2005).Cambridge, London.
Minasi, Mark. (2000). Guia completa de mantenimiento y actualización de la PC. 2da Edición, editorial ventura.
Ministerio de Ciencia y Técnología. (1995). Apuntes éticos para la calidad. Costa Rica.
Ministerio de Educación Pública. (2003). Programa de Inglés Para el Ciclo de Transición. Costa Rica.
Ministerio de Educación Pública. (2005). Programas de Inglés I y II Ciclos. Costa Rica.
Ministerio de Educación Pública. (2005). Programas de Inglés III Ciclo y Ed. Diversificada. Costa Rica.
Ministerio de Educación Pública. (2005). Subject area de Conversational English del programa de Ejecutivo para Centros de Servicio. Costa Rica.
Mora G, Guillermo. (1995). Valores humanos y actitudes positivas. Colombia: Editorial MCGRAW-HILL.
Neibauer, Alan R. (199). El ABC de Word 6 para Windows. México: EDICIONES VENTURA.
Perfection. (1995). Ms.Power Point 4.0 P/win paso a paso. México: Editorial MCGRAW-HILL.
Ralph, Soucie. (1995). Aplique microsoft Office. México: Editorial MCGRAW-HILL.
Ramalho, José R. (1995). Ms. Office Standard. México: Editorial MC GRAW-HILL.
Richards, Jack and S. Rodgers. Approaches and
Terroux Georges and Woods Howard. (1990). Teaching English in a World at Peace. Professional Handbook. McGill University.
Tisnado Santana, Marco Antonio. (1995). Exel 5.0. México: Editorial MCGRAW-HILL.
Tisnado Santana, Marco Antonio. (1995). Power Point 4.0 Manual de bolsillo. México: Editorial MCGRAW-HILL.

Vanghan, Tay. (1995). Todo el poder de multimedia. México: Editorial MCGRAW-HILL.
Welsh, Jim y Eder, Jhon. (1995). Pascal: Introducción. España: Editorial MCGRAW-HILL.
Wyatl, Allen L. (1995). La magia de Internet. México: Editorial MCGRAW-HILL.
ZReirs, Ler. (1995). Navegue en Internet. México: Editorial MCGRAW-HILL.

Electronic References

Time for English Net: From teachers to teachers: *http://www.timeforenglish.net/resources/index.htm*
For English teachers of the world: *www.english* *to go.com*
The Internet TESL Journal, Vol. VII, No. 10, October 2001 http://iteslj.org/ http://iteslj.org/Articles/Gatehouse-ESP.html

ANNEXES

ANNEX 1

PORTFOLIO OF EVIDENCE

1. CONCEPT

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

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

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

2. ADVANTAGES

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

3. USES AND APPLICATIONS

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

For students
• Allows for active and responsible participation in the development of their knowledge, skills, and abilities

• Develops the self-evaluation processes, learning results, and performance criteria suggested for each study block

4. STRATEGIES

Elements to consider when building a portfolio of evidence :

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

Indirect evidence
-Reports
-Projects

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

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

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

The portfolio of evidence may be different in content and presentation, but should be standardized so that:

• teachers have a clear idea of the required elements in order to be able to give an opinion about the student's competency. It is important to design a complete organizational structure related to the portfolio.
• it allows the student to use it as a personal tool to reflect his/her creativity.

5. PORTFOLIO COMPONENTS

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

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

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

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

• ACADEMIC BACKGROUND
-Courses

- Internship
-Company Practices

• DIAGNOSIS
-Tests
- Questionnaires
- Interviews

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

- EVIDENCE
  Knowledge
  -Questionnaires
  - Written tests

  Performance
  - Laboratory practices or workshop
  - Performance tests

  Product
  -Samples of developed tasks
  - Checklist

- EVALUATION TOOLS

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

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

- OTHER RELEVANT MATERIALS.

6. PORTFOLIO REVIEW EVIDENCE

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

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

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

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

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

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

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

PORFOLIO OF EVIDENCE

STUDENT:

DATE AND PLACE

CONTENTS

PORTFOLIO OF EVIDENCE

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

Student´s name and last name:

RESUME

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

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

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

EVIDENCE

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

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

LEARNING RESULTS COMPARISON SHEET

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

CONCLUSIONS

Observations:

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

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

Recommendations:

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

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

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

ANNEX 2

Communicative Activities

SPEAKING ACTIVITIES

Activity 1

Name: A day in the life.

Topic: Asking about events.

Materials: A piece of paper for each group.

Objectives: To practice asking questions in the past tense.

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

Taken from Cambridge University Press.

Activity 2

Name: Chit Chat

Topic: Personal information

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

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

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

Example:

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

Taken from Oxford University Press

Activity 3

Name: Looking for a job

Topic: Talking about abilities

Language: Use of can to express ability.

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

Objectives: To practice the use of can + abilities.

Vocabulary: Abilities.

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

Example:

Taken from Oxford University Press.

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

Activity 4

Name: Job Prestige

Topic: Occupations

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

Objectives: To practice speaking about occupations.

Process: Outline the task. Give a list of occupation to each student and tell them to rank them according to two criteria. First arrange them in the order in which these jobs are regarded and paid for in our society. 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.
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.