

SECTOR:
COMMERCIAL AND SERVICES

PROGRAM
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

CURRICULAR DESIGN ON COMPETENCY BASED-EDUCATION

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San José – Costa Rica

SECTOR:
COMMERCIAL AND SERVICES

PROGRAM:
COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

ELEVENTH GRADE

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"Al desarrollo por la educación"

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

Presentation of Fundamentals

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

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

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

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

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

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

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

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

and society, in harmony with the environment.

- Develop a workforce that contributes to Costa Rica's competitiveness internationally.

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

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

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

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

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

RATIONALE

COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

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

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

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

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

A new upgraded proposal is presented in Computer Science:

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

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

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

CROSS CURRICULAR THEMES

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

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

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

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

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

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

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

Environmental Culture for Sustainable Development

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

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

Competencies to develop:

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

Integral Sexual Education

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

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

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

Competencies to develop:

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

Health Education

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

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

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

Competencies to develop:

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

Experience of Human Rights Democracy and Peace

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

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

Competencies to develop:

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

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

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

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

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

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

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

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

CROSS-CURRICULAR THEMES COMMITTEE

MSc. Priscilla Arce León. DANEA.

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TEACHING GUIDELINES

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

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

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

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

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

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

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

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

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

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

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

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

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

recognizes students' previous knowledge.

is based on cognitive and metacognitive strategies.

accomplishes complete and complex tasks.

- Learning takes place through:

gradually building knowledge.

the relationship between prior knowledge and new information.

meaningful organization of knowledge for the student.

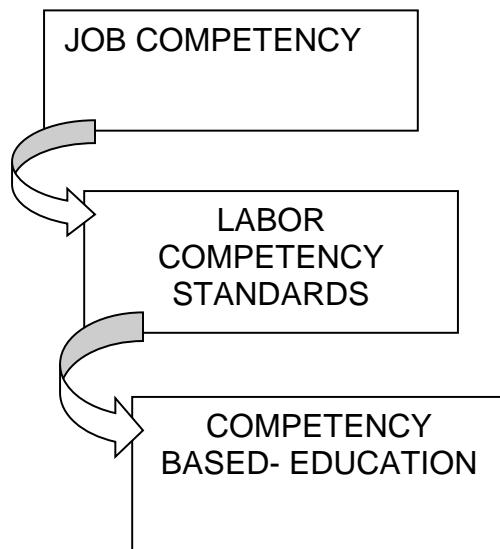
Thus, **General Recommendations** assist in achieving program learning results and purposes:

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

- Basic technical literature for each subject area of the three grades.
- All subject area teachers must provide necessary tools to solve problems in order to create analytical men and women who will be able to provide solutions and alternatives.
- The time allotted to practice and theory must be evenly distributed in accordance with the learning results to be developed.
- Workshops or labs relevant to the subject areas of each program.
- An up-to-dated computer lab with correspondent software based on the requirements of the labor market.
- Provide manual, catalogs and technical literature in English to be consulted by students.
- It is essential to make good use of technological devices such as audiovisual equipment, available material on Internet and others.
- This program should stimulate students' creativity through developing specific projects associated with its contents.
- Teacher should ensure equipment and tool-maintenance, and report regularly to the Principal or Technical Coordinator to make the arrangements for technician assistance.

COMPETENCY BASED EDUCATION ¹

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



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

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

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

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

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

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

Comparison between Technical Traditional Education And Competency- Based Education²

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

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

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

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

Pedagogical Practice Plan

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

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

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

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

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

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

TECHNICAL PROFESSIONAL PROFILE COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

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

TECHNICAL OCCUPATIONAL PROFILE

Technician of Computer Science in Software Development:

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

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

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

PROGRAM OBJECTIVES COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

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

CURRICULAR STRUCTURE PROGRAM COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

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

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

CURRICULAR FRAMEWORK COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT

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

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

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

CURRICULAR MAP COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT TENTH GRADE

SUBJECT- AREA	STUDY BLOCK	LEARNING RESULTS
Information and Communication Technologies 240 hours	Computer basis 24 hours	<ul style="list-style-type: none"> Identify concepts, characteristics and decision elements of information and communication technologies for development (ICT). Interpret elements associated with national and international legislation (ICT). Use basic norms for entering texts.
	Software Application 120 hours	<ul style="list-style-type: none"> Apply basic norms of work to use computer equipment correctly. Solving computer viruses problems. Use available functions in operating systems for computer hardware and software administration. Use several tools for environment management in a graphic operating system. Use available tools for resources management. Apply basic functions of a word processor in the production of documents. Use tools that show a spreadsheet for documents elaboration. Determine the characteristics and configuration of the slides presentations. Generate slides with basic elements. Manipulate objects inside the slides file and assign special effects to presentations.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Information and Communication Technologies 240 hours	Web Design 60 hours	<ul style="list-style-type: none"> • Use applications related to the Internet and for searching and accessing information. • Distinguish basic elements related to the design of web pages. • Demonstrate basic norms for web pages design and Internet site construction. • Design web pages for publication of information in Internet.
	Specialized Information Systems 18 hours	<ul style="list-style-type: none"> • Identify concepts, characteristics and applications of information systems. • Distinguish job environment elements from specialized information systems.
	Connectivity 18 hours	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none"> Aplicar los algoritmos y diagramas de flujo estructurado como herramientas para resolución lógica de problemas computacionales. Aplicar la simbología para la construcción de algoritmos y diagramas de flujo. Utilizar la simbología para la construcción de algoritmos y diagramas de flujo.
	Elementos de Programación 64 horas	<ul style="list-style-type: none"> Distinguir los conceptos básicos relacionados con la programación estructurada. Resolver problemas utilizando los elementos que intervienen en el desarrollo de un programa. Construir bloques de decisión y condiciones compuestas para casos específicos. Utilizar procedimientos y funciones como parte de la solución de problemas específicos. Reconocer los elementos fundamentales para el uso de la sintaxis específica de un lenguaje orientado a la programación estructurada.
	Programación 160 horas	<ul style="list-style-type: none"> Confeccionar los algoritmos necesarios para la solución de problemas específicos utilizando las herramientas disponibles. Desarrollar programas sencillos utilizando estructuras de selección, operadores, estructuras de repetición y funciones. Diseñar programas en un lenguaje de programación que contengan operaciones de manejo de entrada / salida.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Computer Maintenance 320 hours	Occupational Health 64 hours	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none"> • Describe internal components of the computer. • Describe external devices associated with the computer. • Describe different types of software used by the computer.
	Maintenance & Computer Upgrading 176 hours	<ul style="list-style-type: none"> • Describe health and security measures for working with the computer equipment and manual tools. • Build boot and recovery disks as part of the maintenance security or equipment upgrading processes. • Recognize basic norms to continue the preliminary revision and the inventory. • Distinguish different adapters used in computers. • Recognize the installation and/or configuration procedure of different internal computer components. • Recognize the installation and configuration procedure of external computer devices. • Recognize the installation and configuration procedure of operating systems and other software in the computer. • Determine general computer network concepts.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 80 Hours	Building Personal Interaction at the Company. 10 hours	<p>Cognitive Target: 1</p> <p>Exchanging information about: Personal interaction at the company, ways of interacting, meeting people, ethics, personal skills, cultural aspects</p>	<ul style="list-style-type: none"> 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	<p>Cognitive Target: 2</p> <p>Interprets and communicates information about: daily activities at home, school and job. Daily routines</p>	<ul style="list-style-type: none"> 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	<p>Working Conditions and Success at Work. 10 hours</p>	<p>Cognitive Target: 3 Interprets and communicates information about: someone's job, work tasks, and job positions, responsibilities</p>	<ul style="list-style-type: none"> • 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.
	<p>Describing Company Furniture, Equipment and Tools. 10 hours</p>	<p>Cognitive Target: 4 Interprets and communicates information about: company furniture, equipment and tools</p>	<ul style="list-style-type: none"> • 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	<p>Study Block 1: Talking about Plans, Personal and Educational Goals. 10 hours</p> <p>Study Block 2: Communicating Effectively and Giving Presentations. 10 hours</p>	<p>Cognitive Target: 5 Exchanging information about: leisure activities, holidays and special occasions. Planning educational and personal goals.</p> <p>Cognitive Target: 6 Interprets and communicates information about: daily activities at home, school and job. Daily routines.</p>	<ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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	<p>Cognitive Target: 7</p> <p>Using appropriate language for comparing goods, discussing advertisements, describing products and your preferences.</p>	<p>Discussing about advertisements from different communication media.</p> <p>Comparing goods and services and explaining the reasons why I like a product.</p> <p>Describing product characteristics by contrasting and comparing different goods or services.</p> <p>Expanding reading skills by reading job ads from newspapers or magazines and reading formal letters of complaint.</p> <p>Writing a formal letter of complaint, completing a product comparison chart and writing an advertisement.</p>

CURRICULAR MAP COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT ELEVENTH GRADE

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Programming 720 hours	Programming 72 hours	<ul style="list-style-type: none">• Identify the elements included in the work environment of programming language.• Develop simple programs using selection structures, operators, repetitive structures and functions in a specific language.• Apply the tools and functions in programming language for input / output management.

SUBJECT-AREA	STUDY BLOCK	LEARNING RESULTS
Programming 720 hours	Data Structures 90 hours	<ul style="list-style-type: none">Identify the concepts, characteristics, uses and applications of different data structures.Recognize the components of data structures.
	Implementing Data Structures 108 hours	<ul style="list-style-type: none">Use conceptual and theoretical principles for the piles or lines handling as a tool in the solution of specific problems.Applying the theory of graphs and trees as strategies for the resolution of specific problems.Use available tools for the definition, declaration and files management.Apply different methods and techniques for program validation.

SUBJECT-AREA	STUDY BLOCK	LEARNING RESULTS
Programming 720 hours	Introduction to Object Oriented Programming 108 hours	<ul style="list-style-type: none"> Identify object oriented programming concepts, characteristics and applications. Apply modularity principles used for object oriented programming. Distinguish fundamental elements in object oriented programming.
	Object Oriented Programming 108 hours	<ul style="list-style-type: none"> Apply object oriented programming concepts in problem solving. Use principles and fundamentals of object oriented programming as tools for specific problem solving. Develop different applications using Object Oriented Programming principles.
	Quality Culture 54 hours	<ul style="list-style-type: none"> Relate basic principles of quality with the development of daily tasks of a Computer systems technician. Applies the concepts associated to customer service in the tasks performance related to a computer systems technician. Recognize the contribution of team work to achieve the target goals.

SUBJECT-AREA	STUDY BLOCK	LEARNING RESULTS
Programming 720 hours	Marketing 54 hours	<ul style="list-style-type: none">• Identify the concepts and fundamentals of marketing in the context of software development.• Distinguish marketing stages as applied to software development.• Apply marketing principles in defining the target population of a software product.
	Management of Computer Projects 126 hours	<ul style="list-style-type: none">• Identify basic elements in the management of projects.• Recognize elements that integrate the stages and components of software project management process.• Apply fundamental principles related to management and development of projects.• Apply skills, abilities, and knowledge related to software project management in an internship.

SUB - AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Interfaces Gráficas de Usuario 160 horas	Principios de Diseño 12 horas	<ul style="list-style-type: none">• Identificar los conceptos, elementos y procesos fundamentales del diseño.• Aplicar los principios fundamentales que regulan el diseño.
	Teoría del Color 20 horas	<ul style="list-style-type: none">• Identificar los conceptos y elementos fundamentales relacionados con la teoría del color.• Aplicar los principios básicos de la teoría del color en el desarrollo de proyectos.• Aplicar los modos del color en proyectos de diseño.
	Diseño Tipográfico y Composición Artística 32 horas	<ul style="list-style-type: none">• Identificar los conceptos y elementos fundamentales relacionados con la tipografía.• Aplicar los principios que rigen el diseño tipográfico en la confección de diferentes elementos gráficos.• Identificar los conceptos y técnicas fundamentales de la percepción y distribución espacial

SUB - AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Interfaces Gráficas de Usuario 160 horas	Diseño Digital 32 horas	<ul style="list-style-type: none"> • Identificar las funciones y herramientas disponibles en un software específico para la elaboración de diseños digitales. • Utilizar las herramientas disponibles en diferentes software específicos para diseño digital. • Reconocer los tipos de imágenes y ajustes de color que se pueden trabajar en el diseño gráfico con el apoyo de un software específico. • Utilizar las opciones de preferencias y selecciones en un software específico. • Utilizar las herramientas y funciones para el manejo de capas, canales y máscaras en un software específico. • Utilizar las herramientas y funciones disponibles para el manejo de texto en un software específico. • Utilizar las herramientas disponibles para pintar y colorear con un software específico. • Utilizar las funciones y herramientas disponibles en un software específico para el uso de filtros.
	Fotografía Digital 24 horas	<ul style="list-style-type: none"> • Examinar los aspectos fundamentales para la toma de fotografías digitales. • Distinguir los componentes y funcionamiento de la cámara fotográfica digital. • Aplicar las normas de seguridad en el uso y mantenimiento de la cámara fotográfica. • Aplicar los principios del proceso fotográfico digital en la toma de imágenes.

SUB – AREA	UNIDAD DE ESTUDIO	RESULTADOS DE APRENDIZAJE
Interfaces Gráficas de Usuario 160 horas	Interfaz Gráfica de Usuario 40 horas	<ul style="list-style-type: none">• Identificar los conceptos y elementos básicos de la identidad corporativa.• Distinguir las normas y técnicas básicas para la elaboración de la identidad corporativa de un ente determinado.• Identificar los conceptos, características y elementos que integran las Interfaces Gráficas de Usuario.• Aplicar las normas básicas para el diseño y construcción de Interfaces Gráficas de Usuario.• Diseñar diferentes tipos de ventanas de acuerdo con los criterios técnicos establecidos.• Desarrollar interfaces externas que cumplan con las normas técnicas definidas por el usuario.• Aplicar destrezas, habilidades y conocimientos adquiridos referentes a las interfaces gráficas por medio de una pasantía.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 80 Hours	Safe Work 10 hours	<p>Cognitive Target: 1</p> <p>Exchanging information about: safe and unsafe driving, accidents and job benefits</p>	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> 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	<p>Cognitive Target: 3</p> <p>Interprets and communicates information about: workplace rules and following them.</p>	<ul style="list-style-type: none"> 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	<p>Cognitive Target: 4 Exchanging information about: making complaints, apologizing and solving problems</p>	<ul style="list-style-type: none"> 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	<p>Cognitive Target: 5</p> <p>Interprets and communicates information about: technical vocabulary related to manuals and catalogue instructions</p>	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> • 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	<p>Cognitive Target: 7</p> <p>Demonstrate ability to work cooperatively with others.</p>	<ul style="list-style-type: none"> Entertaining guests and promoting leisure activities. Listening to information about a TV schedule. Discussing corporate entertaining. Reading a journal about a trip or magazine descriptions. Organizing a conference in another country including a variety of aspects.

CURRICULAR MAP COMPUTER SCIENCE IN SOFTWARE DEVELOPMENT TWELFTH GRADE

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Programming 300 hours	Programming 96 hours	<ul style="list-style-type: none">• Identify elements that integrate the work environment of programming languages.• Use the instructions, commands, operators and other elements integrating the syntax of programming language.• Apply selection, repetition and other available structures in specific applications development.• Apply tools and functions in programming language when handling input / output operations.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
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Programming
300 hours

WEB Programming
96 hours

.NET Programming
108 hours

- Distinguish main elements of WEB programming.
- Recognize functions and basic tools of programming languages for development of WEB applications.
- Develop simple WEB applications using languages in the market.
- Distinguish fundamental elements for .NET programming.
- Use functions and basic tools for .NET programs development.
- Develop small applications using .NET functions and basic tools.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Data Management 250 hours	Operating Systems 50 hours	<ul style="list-style-type: none"> • Characterize different operating systems using their technical characteristics. • Explain the administration of the processor, process and memory by operating system. • Use operating system functions for administration of devices and files. • Distinguish characteristics of the administrator of net functions and of the system used by the operating system. • Distinguish the characteristics of current common operating systems.
	Databases 90 hours	<ul style="list-style-type: none"> • Identify the basic elements associated with databases. • Describe characteristics of different models of databases and the standardization processes. • Apply elements related to the management of information for the construction and maintenance of databases. • Use functions and tools available for creation or database management.

SUBJECT - AREA	STUDY BLOCK	LEARNING RESULTS
Data Management 250 hours	Business Management 90 hours	<ul style="list-style-type: none">• Recognize the components of the administrative process at work associated with computers.• Elaborate a business plan for a small computer enterprise.• Use different strategies for management and development of computer projects.
	Information Systems 20 hours	<ul style="list-style-type: none">• Identify the fundamental elements related to information.• Recognize concepts, characteristics, applications and other elements related to Information Systems.• Distinguish the stages and phases that compose the analysis and design of Information Systems.

SUBJECT-AREA	STUDY BLOCK	TARGET	LINGUISTIC ACHIEVEMENT
English for Communication 50 Hours	Day to Day Work 10 hours	<p>Cognitive Target: 1</p> <p>Exchanging information about: day to day work.</p>	<ul style="list-style-type: none"> • 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	<p>Cognitive Target: 2</p> <p>Interprets and communicates information about: customer service</p>	<ul style="list-style-type: none"> 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	<p>Cognitive Target: 3</p> <p>Exchanging information about: The ability to work cooperatively with others as a member of a team.</p>	<ul style="list-style-type: none"> 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	<p>Cognitive Target: 4 Interprets and communicates information about travelling</p>	<ul style="list-style-type: none"> 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	<p>Cognitive Target: 5</p> <p>Interprets and communicates information about: applying or transferring skills learned in one job situation to another.</p>	<ul style="list-style-type: none"> Listening to a discussion between two managers. Discussing community problems and solutions by interviewing classmates. Talking about life in a city and contrasting it with life in the country side. Comparing and contrast the lives and goals of people regarding working conditions. Developing consciousness about my skills, achievements and rewards. Organizing ideas to design an improvement plan to change my life.

PROGRAM CONTENTS

ELEVENTH GRADE

SUBJECT – AREA: PROGRAMMING





SUBJECT – AREA: PROGRAMMING

DESCRIPTION

The programming subject area, with 18 hours per week, includes the following study blocks.

- Programming: allows the student to become acquainted with the environments, functions and tools available in the selected programming language. If the same language were to be used as in the sub-area of programming or a language already developed during the tenth year, hours included in this study unit may be redistributed among other study units integrating the sub-area.
- Data Structures: introduces the most important concepts of structures for storage and manipulation of data. Additionally, allows for the application of concepts and principles related to data structures in the development of specific programs.
- Implementation of Structures and Data: allows for the use of conceptual and theoretical concepts related to the management of arrays, pointers, records, and chains such as: tools for the management of stacks, queues, graphs and trees. Also, methods and techniques for the validation of programs and their implementation.
- Introduction to Programming Oriented to Objects: allows student's to identify concepts, characteristics and applications related to objects.
- Object Oriented Programming: introduces student to the development of different applications utilizing programming principles oriented to objects.
- Quality Culture: expects the student to relate the basic principles of quality with the development of daily tasks of a mid-level technician in data processing.
- Marketing and Management of Computer Projects

GENERAL LEARNING RESULTS

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

- Develop programs in a specific programming language.
- Distinguish concepts, characteristics and functioning of different data structures.
- Implement different data structures as a tool for the solution of specific problems.
- Apply marketing principles in software design.
- Manage and develop computer projects.

DISTRIBUTION OF STUDY BLOCK PROGRAMMING

Study block	Name	Time in hours	Weeks per study block
I.	Programming	72	4
II.	Data Structures	90	5
III.	Implementing Data Structures	108	6
IV.	Introduction to Object Oriented Programming	108	6
V.	Object Oriented Programming	108	6
VI.	Quality Culture	54	3
VII.	Marketing	54	3
VIII.	Management of Computer Projects	126	7
	TOTAL	720	40

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Programming
Purpose: Development of programs in the programming language.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Clearly defines the basic concepts related to programming.	Specific
Effectively explains each function of the compiler's functions.	Specific
Correctly identifies functions and application of the compiler.	Specific
Effectively utilizes programming language syntax in the development of programs.	Specific
Accurately identifies selection and repetitive structures utilized.	Specific
Adequately describes the use of operators and invokes functions.	Specific
Effectively solves specific problems utilizing selection or repetitive structures and functions.	Specific
Effectively produces simple programs utilizing structures and functions.	Specific
Accurately distinguishes utilized characteristics and flux types.	Specific
Effectively represents formats used for management of input / output.	Specific
Correctly utilizes flags in the management of input / output.	Specific
Clearly designs programs including management of input / output operations.	Specific

Competency Elements

Reference	Title of the element
1 – 1	Development of programs in the programming language.

Performance Criteria:

1. Identifies the elements included in the work environment of programming language.
2. Develops simple programs utilizing selection structures, operators, repetitive structures and functions in a specific language.
3. Applies the tools and functions in programming language for input / output. Management.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance Evidence:

1. Explains each function of the compiler's functions.
2. Identifies functions and application of the compiler.
3. Describes the use of operators and invokes functions.
4. Represents formats used for management of input / output.
5. Utilizes flags in the management of input / output.

Knowledge Evidence:

1. Defines the basic concepts related to programming.
2. Identifies selection and repetitive structures utilized.
3. Distinguishes utilized characteristics and flux types.

Product Evidence:

1. Utilizes programming language syntax in the development of programs.
2. Solves specific problems utilizing selection or repetitive structures and functions.
3. Produces simple programs utilizing structures and functions.
4. Designs programs including management of input / output operations.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Eleventh
Study block: Programming	Time: 72 hours
Purpose: Development of programs in the programming language.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Identify the elements included in the work environment of programming language.	<ul style="list-style-type: none"> • Functions, uses and applications of the compiler • Basic language concepts: <ul style="list-style-type: none"> • Variables • Constants • Types of data • Reserved words • Operators 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Describes the applications of the compiler. • Demonstrates the functions of the compiler. • Applies syntax utilized in programming language. • Elaborates programs developed in programming language. 	<ul style="list-style-type: none"> • Effort to achieve a goal individually with the help of others. 	<ul style="list-style-type: none"> • Identifies the elements included in the work environment of programming language.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<p><u>Student:</u></p> <ul style="list-style-type: none"> • Defines the basic concepts related to programming. • Explains each function of the compiler's functions. • Identifies functions and application of the compiler. • Utilizes programming language syntax in the development of programs. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Develop simple programs using selection structures, operators, repetitive structures and functions in a specific language.	<ul style="list-style-type: none"> • Operators: <ul style="list-style-type: none"> • Upon assignment • Incremental • Decrease • Logic • Selection structures: <ul style="list-style-type: none"> • If • If / else • While • Repetitive structures: <ul style="list-style-type: none"> • For • Do / while • Functions: <ul style="list-style-type: none"> • Definition • Calling • Per value • Per reference 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines the structures utilized in programming language. • Describes the use of functions and invocations. • Exemplifies selection structure and repetition use for problem solution. • Elaborates developed programs. 	<ul style="list-style-type: none"> • Effort to achieve goal individually with the help of others. 	<ul style="list-style-type: none"> • Develops simple programs using selection structures, operators, repetitive structures and functions in a specific language.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> • Identifies selection and repetitive structures utilized. • Describes the use of operators and invokes functions. • Solves specific problems utilizing selection or repetitive structures and functions. • Produces simple programs utilizing structures and functions. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
3. Apply the tools and functions in programming language for input / output management.	<ul style="list-style-type: none"> • Flux: <ul style="list-style-type: none"> • Concept • Characteristics • Types • Input / output: <ul style="list-style-type: none"> • Characteristics • Syntax • Printing: <ul style="list-style-type: none"> • Whole • Number of floating points • Chains • Characters • Field width and precisions • Flag use • Enter format: <ul style="list-style-type: none"> • Applications • Syntax 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Describes characteristics and types of existing flux. • Illustrates the use of tools for management of input / output. • Exemplifies the procedures for printing different types of data. • Develops the programs for input / output. <p><u>Student:</u></p> <ul style="list-style-type: none"> • Distinguishes utilized characteristics and flux types. • Represents formats used for management of input / output. • Utilizes flags in the management of input / output. • Designs programs including management of input / output operations. 	<ul style="list-style-type: none"> • Effort to achieve a goal individually or by engaging the help of others. 	<ul style="list-style-type: none"> • Applies the tools and functions in programming language for input /output management.

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study block: Programming PRACTICE No. 1

Purpose:

Scenario: Computer Lab Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures:

Teacher:

- Describes the applications of the compiler.
- Demonstrates the functions of the compiler.
- Applies syntax utilized in programming language.
- Elaborates programs developed in programming language.
- Defines the structures utilized in programming language.
- Describes the use of functions and invocations.
- Exemplifies selection structure and repetition use for problem solution.
- Elaborates developed programs.
- Describes characteristics and types of existing flux.
- Illustrates the use of tools for management of input / output.
- Exemplifies the procedures for printing different types of data.
- Develops the programs for input / output.

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
Clearly defines the basic concepts related to programming.			
Effectively explains each function of the compiler's functions.			
Correctly identifies functions and application of the compiler.			
Effectively utilizes programming language syntax in the development of programs.			
Accurately identifies selection and repetitive structures utilized.			
Adequately describes the use of operators and invokes functions.			
Effectively solves specific problems utilizing selection or repetitive structures and functions.			
Effectively produces simple programs utilizing structures and functions.			
Accurately distinguishes utilized characteristics and flux types.			
Effectively represents formats used for management of input / output.			
Correctly utilizes flags in the management of input / output.			
Clearly designs programs including management of input / output operations.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify the elements included in the work environment of programming language.	Identifies the elements included in the work environment of programming language.	Defines the basic concepts related to programming.	Knowledge	Clearly defines the basic concepts related to programming.
		Explains each function of the compiler's functions.	Performance	Effectively explains each function of the compiler's functions.
		Identifies functions and application of the compiler.	Performance	Correctly identifies functions and application of the compiler.
		Utilizes programming language syntax in the development of programs.	Product	Effectively utilizes programming language syntax in the development of programs.
Develop simple programs using selection structures, operators, repetitive structures and functions in a specific language.	Develops simple programs using selection structures, operators, repetitive structures and functions in a specific language.	Identifies selection and repetitive structures utilized.	Knowledge	Accurately identifies selection and repetitive structures utilized.
		Describes the use of operators and invokes functions.	Performance	Adequately describes the use of operators and invokes functions.
		Solves specific problems utilizing selection or repetitive structures and functions.	Product	Effectively solves specific problems utilizing selection or repetitive structures and functions.
		Produces simple programs utilizing structures and functions.	Product	Effectively produces simple programs utilizing structures and functions.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Apply the tools and functions in programming language for input / output management.	Applies the tools and functions in programming language for input / output management.	Distinguishes utilized characteristics and flux types.	Knowledge	Effectively distinguishes utilized characteristics and flux types.
		Represents formats used for management of input / output.	Performance	Accurately represents formats used for management of input / output.
		Utilizes flags in the management of input / output.	Performance	Effectively utilizes flags in the management of input / output.
		Designs programs including management of input / output operations.	Product	Correctly designs programs including management of input / output operations.

TECHNICAL STANDARDS OF THE EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Data Structures
Purpose: Implementation of different data structures as a tool for the solution of specific problems.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly identifies basic concepts related to the use of data.	Specific
Effectively classifies data structures by characteristics.	Specific
Adequately illustrates dynamic and static memory concepts.	Specific
Correctly establishes differences between dynamic and static memory.	Specific
Effectively defines the concept of arrangement.	Specific
Adequately classifies types of arrays according to characteristics.	Specific
Correctly applies method to move from arrays to functions.	Specific
Correctly develops the programs including declarations for arrays management.	Specific
Correctly recognizes procedures for declaration of pointers.	Specific
Effectively applies procedures to initiate variables.	Specific
Adequately utilizes procedures to sort with pointers.	Specific
Correctly resolves specific problems utilizing pointers theory.	Specific
Correctly mentions the concept of characters and chains in the programming environment.	Specific
Adequately recognizes procedures for management of characters and chains.	Specific
Effectively applies necessary processes to perform different operations involving chains.	Specific
Correctly designs programs for chain manipulation.	Specific
Effectively explains concept of records and record arrays.	Specific
Adequately declares records and record arrays.	Specific
Correctly utilizes basic operations with records.	Specific
Effectively solves problems with programmed solutions.	Specific
Adequately defines basic concepts related to linked lists.	Specific
Correctly applies linked lists in resolution of problems.	Specific
Correctly designs programs using linked lists.	Specific

Competency Elements

Reference	Title of the element
1 - 2	Implementation of different data structures as a tool for the solution of specific problems.

Performance criteria:

1. Identifies the concepts, characteristics, uses and applications of different data structures.
2. Recognizes the components of data structures.

Application Field:

Category	Class
Services	Provision of Technical Education Services.

Performance evidence:

1. Classifies data structures by characteristics.
2. Illustrates dynamic and static memory concepts.
3. Establishes differences between dynamic and static memory.
4. Classifies types of arrays according to characteristics.
5. Applies method to move from arrays to functions.
6. Applies procedures to initiate variables.
7. Utilizes procedures to sort with pointers.
8. Recognizes procedures for management of characters and chains.
9. Applies necessary processes to perform different operations involving chains.
10. Declares records and record arrays.
11. Utilizes basic operations with records.
12. Applies linked lists in resolution of problems.

Knowledge Evidence:

1. Identifies basic concepts related to the use of data.
2. Defines the concept of arrangement.
3. Recognizes procedures for declaration of pointers.
4. Mentions the concept of characters and chains in the programming environment.
5. Explains concept of records and record arrays.
6. Defines basic concepts related to linked lists.

Product Evidence:

1. Develops the programs including declarations for arrays management.
2. Resolves specific problems utilizing pointers theory.
3. Designs programs for chain manipulation.
4. Solves problems with programmed solutions.
5. Designs programs using linked lists.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Eleventh
Study Block: Data Structures	Time: 90 hours
Purpose: Implementation of different data structures as a tool for the solution of specific problems.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Identify the concepts, characteristics, uses and applications of different data structures.	<ul style="list-style-type: none"> • The use of data: <ul style="list-style-type: none"> • Information sources • Types of decisions • Data and decisions • Data management • Data structures: <ul style="list-style-type: none"> • Concept • Characteristics • Uses and applications • Classification: <ul style="list-style-type: none"> • Static • Dynamic • Memory: <ul style="list-style-type: none"> • Static • Dynamic 	<u>Teacher:</u> <ul style="list-style-type: none"> • Defines basic concepts of data structures. • Describes characteristics, uses and applications of data structures. • Exemplifies the use of data structures in problem solving. • Explains differences between static and dynamic memory. 	Awareness of the consequences of our actions and omissions.	<ul style="list-style-type: none"> • Identifies the concepts, characteristics, uses and applications of different data structures.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<p><u>Student:</u></p> <ul style="list-style-type: none"> • Identifies basic concepts related to the use of data. • Classifies data structures by characteristics. • Illustrates dynamic and static memory concepts. • Establishes differences between dynamic and static memory. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Recognize the components of data structures.	<ul style="list-style-type: none"> • Arrays: <ul style="list-style-type: none"> • Concept • Types: <ul style="list-style-type: none"> • One dimensional • Multi-dimensional • Declaration • Methods of storage • Syntax • Operation • Moving from arrays to functions • Processing • Search in arrays 	<u>Teacher:</u> <ul style="list-style-type: none"> • Defines concepts related to arrays. • Examines methods to move from arrays to functions. • Specifies sorting and search methods in arrays. • Observes examples of programs that manage arrays. 	<ul style="list-style-type: none"> • Awareness of the consequences of our actions and omissions. 	<ul style="list-style-type: none"> • Recognizes the components of data structures.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> • Defines the concept of arrangement. • Classifies types of arrays according to characteristics. • Applies method to move from arrays to functions. • Develops the programs including declarations for arrays management. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Pointers: <ul style="list-style-type: none"> • Declaration • Initialization of pointers variables • Pointers operators • Summoning functions reference • Qualifier • Processing 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Describes procedures for declaration. • Exemplifies method to initiate variables. • Examines procedures to recall functions. • Develops programs utilizing pointers for the solution of problems. <p><u>Student:</u></p> <ul style="list-style-type: none"> • Recognizes procedures for declaration of pointers. • Applies procedures to initiate variables. • Utilizes procedures to sort with pointers. • Resolves specific problems utilizing pointers theory. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Chains: <ul style="list-style-type: none"> • Concepts • Character management library • Chain conversion • Chain manipulation • Functions related to operations involving chains 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines characters and chains concept. • Exemplifies method for use of library in management of characters. • Examines procedures for chain manipulation. • Development of programs utilizing chains. 		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<p><u>Student:</u></p> <ul style="list-style-type: none"> • Mentions the concept of characters and chains in the programming environment. • Recognizes procedures for management of characters and chains. • Applies necessary processes to perform different operations involving chains. • Designs programs for chain manipulation. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Records: <ul style="list-style-type: none"> • Record formations • Identification passwords • Record declaration • Record arrays • Record operations 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Explains concepts related to use records, and arrays. • Describes syntax utilized in record declaration. • Exemplifies different operations to perform with records. • Elaborates practices of record declarations and arrays. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> • Explains concept of records and record arrays. • Declares records and record arrays. • Utilizes basic operations with records. • Solves problems with programmed solutions. 		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Linked lists: <ul style="list-style-type: none"> • Concept • Representation: <ul style="list-style-type: none"> • Sequential • Non-sequential • Types of lists: <ul style="list-style-type: none"> • Simple • Circular • Double linked • Basic operations • Management of available space • Applications 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines basic concepts related to the use of links. • Applies linked lists in problem solving. • Executes programs managing linked lists. <p><u>Student:</u></p> <ul style="list-style-type: none"> • Defines basic concepts related to linked lists. • Applies linked lists in resolution of problems. • Designs programs using linked lists. 		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Data Structures

PRACTICE No. 1

Purpose:

Scenario: Computer Lab

Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:

- Defines basic concepts of data structures.
- Describes characteristics, uses and applications of data structures.
- Exemplifies the use of data structures in problem solving.
- Explains differences between static and dynamic memory.
- Defines concepts related to arrays.
- Examines methods to move from arrays to functions.
- Specifies sorting and search methods in arrays.
- Observes examples of programs that manage arrays.
- Describes procedures for declaration.
- Exemplifies method to initiate variables.
- Examines procedures to recall functions.
- Develops programs utilizing pointers for the solution of problems.
- Defines characters and chains concept.
- Exemplifies method for use of library in management of characters.
- Examines procedures for chain manipulation.
- Development of programs utilizing chains.
- Explains concepts related to use records, and arrays.
- Describes syntax utilized in record declaration.
- Exemplifies different operations to perform with records.
- Elaborates practices of record declarations and arrays.
- Defines basic concepts related to the use of links.
- Applies linked lists in problem solving.
- Executes programs managing linked lists.

RECOMMENDED CHECKLIST	Date:
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Student's name:	
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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 basic concepts related to the use of data.			
Effectively classifies data structures by characteristics.			
Adequately illustrates dynamic and static memory concepts.			
Correctly establishes differences between dynamic and static memory.			
Effectively defines the concept of arrangement.			
Adequately classifies types of arrays according to characteristics.			
Correctly applies method to move from arrays to functions.			
Correctly develops the programs including declarations for arrays management.			
Correctly recognizes procedures for declaration of pointers.			
Effectively applies procedures to initiate variables.			
Adequately utilizes procedures to sort with pointers.			
Correctly resolves specific problems utilizing pointers theory.			
Correctly mentions the concept of characters and chains in the programming environment.			
Adequately recognizes procedures for management of characters and chains.			
Effectively applies necessary processes to perform different operations involving chains.			

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Correctly designs programs for chain manipulation.			
Effectively explains concept of records and record arrays.			
Adequately declares records and record arrays.			
Correctly utilizes basic operations with records.			
Effectively solves problems of with programmed solutions.			
Adequately defines basic concepts related to linked lists.			
Correctly applies linked lists in resolution of problems.			
Correctly designs programs using linked lists.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify concepts, characteristics, uses and applications of different data structures.	Identifies concepts, characteristics, uses and applications of different data structures.	Identifies basic concepts related to the use of data.	Knowledge	Correctly identifies basic concepts related to the use of data.
		Classifies data structures by characteristics.	Performance	Effectively classifies data structures by characteristics.
		Illustrates dynamic and static memory concepts.	Performance	Adequately illustrates dynamic and static memory concepts.
		Establishes differences between dynamic and static memory.	Performance	Correctly establishes differences between dynamic and static memory.
Recognize the components of each one of the data structures.	Recognizes the components of each one of the different data structures.	Defines the concept of arrangement.	Knowledge	Effectively defines the concept of arrangement.
		Classifies types of arrays according to characteristics.	Performance	Adequately classifies types of arrays according to characteristics.
		Applies method to move from arrays to functions.	Performance	Correctly applies method to move from arrays to functions.
		Develops the programs including declarations for arrays management.	Product	Correctly develops the programs including declarations for arrays management.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
		Recognizes procedures for declaration of pointers.	Knowledge	Correctly recognizes procedures for declaration of pointers.
		Applies procedures to initiate variables.	Performance	Effectively applies procedures to initiate variables.
		Utilizes procedures to sort with pointers.	Performance	Adequately utilizes procedures to sort with pointers.
		Resolves specific problems utilizing pointers theory.	Product	Correctly resolves specific problems utilizing pointers theory.
		Mentions the concept of characters and chains in the programming environment.	Knowledge	Correctly mentions the concept of characters and chains in the programming environment.
		Recognizes procedures for management of characters and chains.	Performance	Adequately recognizes procedures for management of characters and chains.
		Applies necessary processes to perform different operations involving chains.	Performance	Effectively applies necessary processes to perform different operations involving chains.
		Designs programs for chain manipulation.	Product	Correctly designs programs for chain manipulation.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
		Explains concept of records and record arrays.	Knowledge	Effectively explains concept of records and record arrays.
		Declares records and record arrays.	Performance	Adequately declares records and record arrays.
		Utilizes basic operations with records.	Performance	Correctly utilizes basic operations with records.
		Solves problems with programmed solutions.	Product	Effectively solves problems with programmed solutions.
		Defines basic concepts related to linked lists.	Knowledge	Adequately defines basic concepts related to linked lists.
		Applies linked lists in resolution of problems.	Performance	Correctly applies linked lists in resolution of problems.
		Designs programs using linked lists.	Product	Correctly designs programs using linked lists.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Implementation of Data Structures
Purpose: Implementation of different data structures as a tool for the solution of specific problems.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly defines the stacks and queue concepts.	Specific
Effectively identifies storage methods.	Specific
Effectively performs operations involving stacks and queues.	Specific
Correctly designs programs using stack and queue theories.	Specific
Correctly defines basic concepts related to graphs.	Specific
Effectively identifies critical paths in different graphs.	Specific
Effectively performs the trajectory of specific graphs.	Specific
Correctly utilizes graphs in program development.	Specific
Correctly defines basic concepts related to trees.	Specific
Effectively identifies different types of trees.	Specific
Effectively applies procedure for balancing of binary search trees.	Specific
Correctly designs programs using trees.	Specific
Effectively demonstrates procedure for balancing binary search trees.	Specific
Clearly solves problems by using trees.	Specific
Correctly develops programs that use trees.	Specific
Properly defines basic concepts related to file management.	Specific
Clearly describes procedures for file access.	Specific
Correctly applies different methods for file access.	Specific
Effectively designs programs illustrating possible operations with files.	Specific
Effectively explains concepts related to the use of sequential concepts.	Specific
Correctly illustrates the procedures for sorting records and information storage.	Specific
Correctly applies procedures for sorting and merging files.	Specific

Effectively develops the programs illustrating sequential file management.	Specific
Effectively defines sequential files.	Specific
Correctly applies procedures for the creation, updating and recovery of information in sequential files.	Specific
Clearly applies sorting and merging of files.	Specific
Effectively designs programs for management of sequential files.	Specific
Adequately defines storage techniques.	Specific
Correctly uses addressing, mapping, search and addresses calculation.	Specific
Effectively uses methods for collision management.	Specific
Clearly designs programs for management of relative files.	Specific
Correctly recognizes the basic concepts related to sequential indexed files.	Specific
Adequately applies sequential indexed files in problem solving.	Specific
Effectively exemplifies use of sequential indexed files.	Specific
Effectively designs programs using sequential indexed files.	Specific
Clearly defines concepts related to program validation.	Specific
Effectively identifies standards for development of good programs.	Specific
Adequately applies test for program evaluation.	Specific
Correctly uses different methods for program validation.	Specific

Competency Elements

Reference	Title of the element
1 - 3	Implementation of different data structures as a tool for the solution of specific problems.

Performance criteria:

1. Uses conceptual and theoretical principles for management of stacks or queues as tools for problem solving.
2. Applies the theory of graphs and trees as strategies for specific problem solving.
3. Uses available tools for definition, declaration and management of files.
4. Applies different methods and techniques for the validation of programs.

Application Field:

Category
Services

Classes

Provision of Technical Education Services

Performance Evidence:

1. Identifies storage methods.
2. Performs operations involving stacks and queues.
3. Performs the trajectory of specific graphs.
4. Utilizes graphs in program development.
5. Applies procedure for balancing of binary search trees.
6. Demonstrates procedure for balancing binary search trees.
7. Applies different methods for file access.
8. Designs programs illustrating possible operations with files.
9. Applies procedures for the creation, updating and recovery of information in sequential files.
10. Applies sorting and merging of files.
11. Uses addressing, mapping, search and addresses calculation.
12. Uses methods for collision management.
13. Applies sequential indexed files in problem solving.
14. Exemplifies use of sequential indexed files.
15. Identifies standards for development of good programs.
16. Applies test for program evaluation.
17. Uses different methods for program validation.

Knowledge Evidence:

1. Defines the stacks and queue concepts.
2. Defines basic concepts related to graphs.
3. Identifies critical paths in different graphs.
4. Defines basic concepts related to trees.
5. Identifies different types of trees.
6. Defines basic concepts related to file management.
7. Describes procedures for file access.

8. Defines sequential files.
9. Defines storage techniques.
10. Recognizes the basic concepts related to sequential indexed files.
11. Defines concepts related to program validation.

Product Evidence:

1. Designs programs using stack and queue theories.
2. Designs programs using trees.
3. Solves problems by using trees.
4. Develops programs that use trees.
5. Designs programs for management of relative files.
6. Designs programs for management of sequential files.
7. Designs programs using sequential indexed files.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Eleventh
Study Block: Implementation of Data Structures	Time: 108 hours
Purpose: Implementation of different data structures as a tool for the solution of specific problems.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Use conceptual and theoretical principles for the piles or lines handling as a tool in the solution of specific problems.	<ul style="list-style-type: none"> • Stacks : <ul style="list-style-type: none"> • Concept • Operations on stacks • Stacks declaration • Applications • Storage methods • Queues: <ul style="list-style-type: none"> • Concept • Queues theory • Operations • Waiting queues • Declaration • Behavior 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines concept of stacks and queues. • Describes procedures for stacks and queues declaration. • Describes storage methods. • Develops programs using stacks and queues. 	<ul style="list-style-type: none"> • Awareness of the consequences of our actions and omissions. 	<ul style="list-style-type: none"> • Uses conceptual and theoretical principles for management of stacks or queues as tools for problem solving.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> • Defines the stacks and queue concepts. • Identifies storage methods. • Performs operations involving stacks and queues. • Designs programs using stack and queue theories. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Apply the theory of graphs and trees as strategies for specific problem solving.	<ul style="list-style-type: none"> • Graphs: <ul style="list-style-type: none"> • Definitions • Paths Trajectories • Cycles • Directed graphs programs • Trajectories • Searches • Critical paths 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines basic concepts related to graphs. • Describes trajectories and cycles. • Applies procedure for identification of critical paths. • Utilizes graphs in program development. 	<ul style="list-style-type: none"> • Awareness of the consequences of our actions and omissions. 	<ul style="list-style-type: none"> • Applies the theory of graphs and trees as strategies for specific problem solving.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> • Defines basic concepts related to graphs. • Identifies critical paths in different graphs. • Performs the trajectory of specific graphs. • Utilizes graphs in program development. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Trees: <ul style="list-style-type: none"> • Concept • Types: <ul style="list-style-type: none"> • General • Binary • Binary search • Linked binaries • Representation • Definition • Searches: <ul style="list-style-type: none"> • Sequential • Directs • Operations: <ul style="list-style-type: none"> • Insertion • Suppression 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines basic concepts related to trees. • Classifies trees according to characteristics. • Uses the search and sorting methods in trees. • Exemplifies nodes insertion and suppression operations. <p><u>Student:</u></p> <ul style="list-style-type: none"> • Defines basic concepts related to trees. • Identifies different types of trees. • Applies procedure for balancing of binary search trees. • Designs programs using trees. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Balancing binary search tree by: <ul style="list-style-type: none"> • the height • a limit • inter-change 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Demonstrates procedure for balancing binary search trees. • Solves problems by using trees. • Develops programs that use trees. <p><u>Student:</u></p> <ul style="list-style-type: none"> • Demonstrates procedure for balancing binary search trees. • Solves problems by using trees. • Develops programs that use trees. 		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
3. Use available tools for definition, declaration and management of files.	<ul style="list-style-type: none"> • Files: <ul style="list-style-type: none"> • Concept • Classification • Ways to access files • File organization • Operations about files • File systems • File directories • Control devices: <ul style="list-style-type: none"> • Channels • Types of channels • Types of devices • Channel activities • Processing of a reading • Record blocking • Buffer management and temporary storage • Opening and closing of files 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Identifies possible solutions to problems using each kind of file. • Applies different methods to access a file. • Uses control devices in the management of files. • Develops programs that perform different file operations. <p><u>Student:</u></p> <ul style="list-style-type: none"> • Defines basic concepts related to file management. • Describes procedures for file access. • Applies different methods for file access. • Designs programs illustrating possible operations with files. 	<ul style="list-style-type: none"> • Awareness of the consequences of our actions and omissions. 	<ul style="list-style-type: none"> • Uses available tools for definition, declaration and management of files.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Organization of sequential files: <ul style="list-style-type: none"> • Definitions • Declaration • Sorting records • Storing • Creation and actualization • Recovery of information • Sorting and merging of files: <ul style="list-style-type: none"> • Intercalations • Naturals • Cascades • Balanced • Polyphase • Processing • Performance of processing and intercalation 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Explains concepts related to the use of sequential concepts. • Illustrates the procedures for sorting records and information storage. • Applies procedures for sorting and merging files. • Develops the programs illustrating sequential file management. <p><u>Student:</u></p> <ul style="list-style-type: none"> • Defines sequential files. • Applies procedures for the creation, updating and recovery of information in sequential files. • Applies sorting and merging of files. • Designs programs for management of sequential files. 		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Organization of relative files: <ul style="list-style-type: none"> • Concept • Storage • Addressing techniques • Direct mapping techniques • Techniques to search in directory • Techniques for address calculations • Methods for collision problems • Use of relative files • Performance 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines storing techniques. • Demonstrates techniques for addressing, mapping search and addresses calculation. • Exemplifies use of relative files. • Develops programs for management of information using relative files. <p><u>Student:</u></p> <ul style="list-style-type: none"> • Defines storage techniques. • Uses addressing, mapping, search and addresses calculation. • Uses methods for collision management. • Designs programs for management of relative files. 		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Organization of indexed sequential files: <ul style="list-style-type: none"> • Concept • Applications • Definition • Syntax • Operations • Examples 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Explains the basic concepts related to sequential indexed files. • Exemplifies the syntax for declaration and management of sequential indexed files. • Applies the sequential indexed files for the solution of information management problems. • Develops the programs using sequential indexed files. 		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> • Recognizes the basic concepts related to sequential indexed files. • Applies sequential indexed files in problem solving. • Exemplifies use of sequential indexed files. • Designs programs using sequential indexed files. 		

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
4. Apply different methods and techniques for the validation of programs.	<ul style="list-style-type: none"> • Program validation: <ul style="list-style-type: none"> • Concept • Programs test • Basic rules to write good programs • Utilization of documentation in program development • Preparation of manuals: <ul style="list-style-type: none"> • Technical • For the user 	<u>Teacher:</u> <ul style="list-style-type: none"> • Defines basic concepts related to program validation. • Identifies standards for development of good programs. • Exemplifies use of program documentation. • Uses tests for program evaluation. 	<ul style="list-style-type: none"> • Awareness of the consequences of our actions and omissions. 	<ul style="list-style-type: none"> • Applies different methods and techniques for the validation of programs.

LEARNING RESULTS	CONTENTS	TEACHING / LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> • Defines concepts related to program validation. • Identifies standards for development of good programs. • Applies test for program evaluation. • Uses different methods for program validation. 		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Data Structures Implementation PRACTICE No. 1

Purpose:

Scenario: Computer Lab Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures:

Teacher:

- Defines concept of stacks and queues.
- Describes procedures for stacks and queues declaration.
- Describes storage methods.
- Develops programs using stacks and queues.
- Defines basic concepts related to graphs.
- Describes trajectories and cycles.
- Applies procedure for identification of critical paths.
- Utilizes graphs in program development.
- Defines basic concepts related to trees.
- Classifies trees according to characteristics.
- Uses the search and sorting methods in trees.
- Exemplifies nodes insertion and suppression operations.
- Demonstrates procedure for balancing binary search trees.
- Solves problems by using trees.
- Develops programs that use trees.
- Identifies possible solutions to problems using each kind of file.
- Applies different methods to access a file.
- Uses control devices in the management of files.
- Develops programs that perform different file operations.
- Defines storing techniques.
- Demonstrates techniques for addressing, mapping search and addresses calculation.
- Exemplifies use of relative files.
- Develops programs for management of information using relative files.

Procedures:

Teacher:

- Explains the basic concepts related to sequential indexed files.
- Exemplifies the syntax for declaration and management of sequential indexed files.
- Applies the sequential indexed files for the solution of information management problems.
- Develops the programs using sequential indexed files.
- Defines basic concepts related to program validation.
- Identifies standards for development of good programs.
- Exemplifies use of program documentation.
- Uses tests for program evaluation.

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 the stacks and queue concepts.			
Effectively identifies storage methods.			
Effectively performs operations involving stacks and queues.			
Correctly designs programs using stack and queue theories.			
Correctly defines basic concepts related to graphs.			
Effectively identifies critical paths in different graphs.			
Effectively performs the trajectory of specific graphs.			
Correctly utilizes graphs in program development.			
Correctly defines basic concepts related to trees.			
Effectively identifies different types of trees.			
Effectively applies procedure for balancing of binary search trees.			
Correctly designs programs using trees.			
Effectively demonstrates procedure for balancing binary search trees.			
Clearly solves problems by using trees.			
Correctly develops programs that use trees.			
Properly defines basic concepts related to file management.			
Clearly describes procedures for file access.			
Correctly applies different methods for file access.			

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Effectively designs programs illustrating possible operations with files.			
Effectively explains concepts related to the use of sequential concepts.			
Correctly illustrates the procedures for sorting records and information storage.			
Correctly applies procedures for sorting and merging files.			
Effectively develops the programs illustrating sequential file management.			
Effectively defines sequential files.			
Correctly applies procedures for the creation, updating and recovery of information in sequential files.			
Clearly applies sorting and merging of files.			
Effectively designs programs for management of sequential files.			
Adequately defines storage techniques.			
Correctly uses addressing, mapping, search and addresses calculation.			
Effectively uses methods for collision management.			
Clearly designs programs for management of relative files.			
Correctly recognizes the basic concepts related to sequential indexed files.			
Adequately applies sequential indexed files in problem solving.			
Effectively exemplifies use of sequential indexed files.			
Effectively designs programs using sequential indexed files.			
Clearly defines concepts related to program validation.			
Effectively identifies standards for development of good programs.			
Adequately applies test for program evaluation.			
Correctly uses different methods for program validation.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use conceptual and theoretical principles for the piles or lines handling as a tool in the solution of specific problems.	Uses conceptual and theoretical principles for the piles or lines handling as a tool in the solution of specific problems.	Defines the stacks and queue concepts.	Knowledge	Correctly defines the stacks and queue concepts.
		Identifies storage methods.	Performance	Effectively identifies storage methods.
		Performs operations involving stacks and queues.	Performance	Effectively performs operations involving stacks and queues.
		Designs programs using stack and queue theories.	Product	Correctly designs programs using stack and queue theories.
Apply the theory of graphs and trees as strategies for specific problem solving.	Applies the theory of graphs and trees as strategies for specific problem solving.	Defines basic concepts related to graphs.	Knowledge	Correctly defines basic concepts related to graphs.
		Identifies critical paths in different graphs.	Knowledge	Effectively identifies critical paths in different graphs.
		Performs the trajectory of specific graphs.	Performance	Effectively performs the trajectory of specific graphs.
		Utilizes graphs in program development.	Performance	Correctly utilizes graphs in program development.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
		Defines basic concepts related to trees.	Knowledge	Correctly defines basic concepts related to trees.
		Identifies different types of trees.	knowledge	Effectively identifies different types of trees.
		Applies procedure for balancing of binary search trees.	Performance	Effectively applies procedure for balancing of binary search trees.
		Designs programs using trees.	Product	Correctly designs programs using trees.
		Demonstrates procedure for balancing binary search trees.	Performance	Effectively demonstrates procedure for balancing binary search trees.
		Solves problems by using trees.	Product	Clearly solves problems by using trees.
		Develops programs that use trees.	Product	Correctly develops programs that use trees.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Use available tools for definition, declaration and management of files.	Uses available tools for definition, declaration and management of files.	Defines basic concepts related to file management.	knowledge	Properly defines basic concepts related to file management.
		Describes procedures for file access.	knowledge	Clearly describes procedures for file access.
		Applies different methods for file access.	Performance	Correctly applies different methods for file access.
		Designs programs illustrating possible operations with files.	Performance	Effectively designs programs illustrating the different possible operations with files.
		Defines sequential files.	knowledge	Effectively defines the sequential files.
		Applies procedures for the creation, updating and recovery of information in sequential files.	Performance	Correctly applies the procedures for the creation, updating and recovery of information in sequential files.
		Applies sorting and merging of files.	Performance	Correctly applies the sorting and merging of files.
		Designs programs for management of sequential files.	Product	Effectively designs programs for management of sequential files.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
		Defines storage techniques.	knowledge	Adequately defines storage techniques.
		Uses addressing, mapping, search and addresses calculation.	Performance	Correctly uses addressing, mapping, search and addresses calculation.
		Uses methods for collision management.	Performance	Effectively uses methods for collision management.
		Designs programs for management of relative files.	Product	Clearly designs programs for management of relative files.
		Recognizes the basic concepts related to sequential indexed files.	knowledge	Correctly recognizes the basic concepts related to sequential indexed files.
		Applies sequential indexed files in problem solving.	Performance	Adequately applies sequential indexed files in problem solving.
		Exemplifies use of sequential indexed files.	Performance	Effectively exemplifies use of sequential indexed files.
		Designs programs using sequential indexed files.	Product	Effectively designs programs using sequential indexed files.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Apply the different methods and techniques for the validation of programs.	Applies the different methods and techniques for the validation of programs.	Defines concepts related to program validation.	Knowledge	Clearly defines concepts related to program validation.
		Identifies standards for development of good programs.	Performance	Effectively identifies standards for development of good programs.
		Applies test for program evaluation.	Performance	Adequately applies test for program evaluation.
		Uses different methods for program validation.	Performance	Correctly uses different methods for program validation.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Introduction to Object Oriented Programming
 Purpose: Implementation of elements related to programming oriented to objects in the solution of specific problems.
 Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly mentions the basic elements related to abstraction.	Specific
Effectively identifies the characteristics, uses or applications in programming.	Specific
Effectively recognizes different types of abstract data.	Specific
Correctly identifies uses and applications of OOP objects.	Specific
Correctly mentions modularity concept.	Specific
Effectively identifies modularity characteristics.	Specific
Effectively applies strategies for module construction.	Specific
Correctly designs programs using procedures for implementation of types of data.	Specific
Correctly mentions concepts related to objects.	Specific
Effectively recognizes the uses and applications of objects in programming.	Specific
Effectively explains procedures for communication among objects.	Specific
Effectively demonstrates concepts associated with objects.	Specific

Competency Elements

Reference	Title of the element
1 - 4	Implementation of elements related to programming oriented to objects in the solution of specific problems

Performance criteria:

1. Identifies object oriented programming concepts, characteristics and applications.
2. Applies modularity principles used for object oriented programming.
3. Distinguishes the fundamental elements in object oriented programming.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance Evidence:

1. Recognizes different types of abstract data.
2. Applies strategies for module construction.
3. Explains procedures for communication among objects.

Knowledge Evidence:

1. Mentions the basic elements related to abstraction.
2. Identifies the characteristics, uses or applications in programming.
3. Identifies uses and applications of oop objects.
4. Mentions modularity concept.
5. Identifies modularity characteristics.
6. Mentions concepts related to objects.
7. Recognizes the uses and applications of objects in programming.

Product Evidence:

1. Designs programs using procedures for implementation of types of data.
2. Demonstrates concepts associated with objects.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Eleventh
Study Block: Introduction to Object Oriented Programming	Time: 108 hours
Purpose: Implementation of elements related to programming oriented to objects in the solution of specific problems.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Identify object oriented programming concepts, characteristics and applications.	<ul style="list-style-type: none"> • Programming and abstraction: <ul style="list-style-type: none"> • Abstraction • Procedures, modules, objects • Types of abstract data • Programming • Structured programming vs OOP • Orientation to objects: <ul style="list-style-type: none"> • Abstraction • Encapsulation • Modularity • Hierarchy • Polymorphism 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines basic elements related to abstraction. • Describes the characteristics, uses or applications of abstraction in programming. • Illustrates the different types of abstract data. • Describes the uses and applications of OOP elements. 	<ul style="list-style-type: none"> • Awareness of consequences of our actions and omissions. 	<ul style="list-style-type: none"> • Identifies object oriented programming concepts, characteristics and applications.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Languages oriented to objects: <ul style="list-style-type: none"> • Taxonomy • Characteristics • Applications • Advantages and disadvantages 	<p><u>Student:</u></p> <ul style="list-style-type: none"> • Mentions the basic elements related to abstraction. • Identifies the characteristics, uses or applications in programming. • Recognizes different types of abstract data. • Identifies uses and applications of OOP objects. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Apply modularity principles used for object oriented programming	<ul style="list-style-type: none"> • Modularity: <ul style="list-style-type: none"> • Concept • Characteristics • Modules: <ul style="list-style-type: none"> • Design • Structure • Modularity Rules • Types of data • Implementation of abstract types of data 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Describes characteristics of languages oriented to objects. • Indicates basic elements of languages oriented to objects. • Explains the strategies for module construction. • Exemplifies procedures for implementation of types of data. 	<ul style="list-style-type: none"> • Awareness of consequences of our actions and omissions. 	Applies modularity principles used for object oriented programming.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> • Mentions modularity concept. • Identifies modularity characteristics. • Applies strategies for module construction. • Designs programs using procedures for implementation of types of data. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
3. Distinguish fundamental elements in object oriented programming.	<ul style="list-style-type: none"> • OOP: <ul style="list-style-type: none"> • Objects: <ul style="list-style-type: none"> • Concept • Characteristics • Objects before classes • Methods and messages • Classes • Communications among objects • Internal structure of an object • Inheritance • Overload 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines concepts related to objects. • Describes use and applications of objects in programming. • Explains basic standards for working with classes and inheritance. • Exemplifies the concepts associated with objects. 	<ul style="list-style-type: none"> • Awareness of consequences of our actions and omissions. 	<ul style="list-style-type: none"> • Distinguishes the fundamental elements in object oriented programming.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> Mentions concepts related to objects. Recognizes the uses and applications of objects in programming. Explains procedures for communication among objects. Demonstrates concepts associated with objects. 		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Introduction to Object Oriented Programming | PRACTICE No. 1

Purpose:

Scenario: Computer Lab | Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures:

Teacher:

- Defines basic elements related to abstraction.
- Describes the characteristics, uses or applications of abstraction in programming.
- Illustrates the different types of abstract data.
- Describes the uses and applications of OOP elements.
- Describes characteristics of languages oriented to objects.
- Indicates basic elements of languages oriented to objects.
- Explains the strategies for module construction.
- Exemplifies procedures for implementation of types of data.
- Defines concepts related to objects.
- Describes use and applications of objects in programming.
- Explains basic standards for working with classes and inheritance.
- Exemplifies the concepts associated with objects.

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 the basic elements related to abstraction.			
Effectively identifies the characteristics, uses or applications in programming.			
Effectively recognizes different types of abstract data.			
Correctly identifies uses and applications of OOP objects.			
Correctly mentions modularity concept.			
Effectively identifies modularity characteristics.			
Effectively applies strategies for module construction.			
Correctly designs programs using procedures for implementation of types of data.			
Correctly mentions concepts related to objects.			
Effectively recognizes the uses and applications of objects in programming.			
Effectively explains procedures for communication among objects.			
Effectively demonstrates concepts associated with objects.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify object oriented programming concepts, characteristics and applications.	Identifies object oriented programming concepts, characteristics and applications.	Mentions the basic elements related to abstraction.	Knowledge	Correctly mentions the basic elements related to abstraction.
		Identifies the characteristics, uses or applications in programming.	Knowledge	Effectively identifies the characteristics, uses or applications in programming.
		Recognizes different types of abstract data.	Performance	Effectively recognizes different types of abstract data.
		Identifies uses and applications of oop objects.	Knowledge	Correctly identifies uses and applications of OOP objects.
Apply modularity principles used for object oriented programming	Applies modularity principles used for object oriented programming.	Mentions modularity concept.	Knowledge	Correctly mentions modularity concept.
		Identifies modularity characteristics.	Knowledge	Effectively identifies modularity characteristics.
		Applies strategies for module construction.	Performance	Effectively applies strategies for module construction.
		Designs programs using procedures for implementation of types of data.	Product	Correctly designs programs using procedures for implementation of types of data.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Distinguish fundamental elements in object oriented programming.	Distinguishes fundamental elements in object oriented programming.	Mentions concepts related to objects.	Knowledge	Correctly mentions concepts related to objects.
		Recognizes the uses and applications of objects in programming.	knowledge	Effectively recognizes the uses and applications of objects in programming.
		Explains procedures for communication among objects.	Performance	Effectively explains procedures for communication among objects.
		Demonstrates concepts associated with objects.	Product	Effectively demonstrates concepts associated with objects.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Object Oriented Programming
Purpose: Development of programs oriented to objects in the programming language.
Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly identifies characteristics of the OOP elements in context.	Specific
Effectively recognizes procedures for declaration, invocation and execution of OOP elements.	Specific
Correctly applies OOP principles of structure implementation.	Specific
Accurately exemplifies principle for the implementation of structures.	Specific
Adequately implements inheritance and polymorphism concepts in applications.	Specific
Correctly implements E/E operations.	Specific
Effectively applies procedures for exceptions management.	Specific
Clearly identifies process stages for the creation of a OOP program	Specific
Accurately applies programming techniques and good practices.	Specific
Adequately uses methods for declaration and encoding of different OOP elements.	Specific
Effectively uses procedures for OOP construction.	Specific

Competency Elements

Reference	Title of the element
1 - 5	Development of programs oriented to objects in the programming language

Performance criteria:

1. Applies object oriented programming concepts in problem solving.
2. Uses principles and fundamentals of object oriented programming as tools for specific problem solving.
3. Develop different applications using OOP principles.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance Evidence:

1. Applies OOP principles of structure implementation.
2. Applies procedures for exceptions management.
3. Applies the programming techniques and good practices.
4. Utilizes the methods for declaration and encoding of different OOP elements.

Knowledge Evidence:

1. Identifies characteristics of the OOP elements in context.
2. Recognizes procedures for declaration, invocation and execution of OOP elements.
3. Identifies the process stages for the creation of a OOP program

Product Evidence:

1. Exemplifies principle for the implementation of structures.
2. Implements inheritance and polymorphism concepts in applications.
3. Implements E/E operations.
4. Utilizes the procedures for OOP construction.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Eleventh
Study Block: Object Oriented Programming	Time: 108 hours
Purpose: Development of programs oriented to objects in the programming language.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Apply object oriented programming concepts in problem solving.	<ul style="list-style-type: none"> • Object Oriented Programming: <ul style="list-style-type: none"> • Classes • References to objects • Instance variables • Operators • Methods: <ul style="list-style-type: none"> • Declaration • Invocation • Regarding writing • Overload • Constructors • Destroyers 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines OOP concepts in programming context. • Describes procedures for declaration, invocation and execution of OOP elements. • Illustrates the strategies for use and application of OOP elements. • Exemplifies principle for implementation of structures. 	<ul style="list-style-type: none"> • Effort to achieve a goal individually or by engaging the help of others. 	<ul style="list-style-type: none"> • Applies object oriented programming concepts in problem solving.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Management of data structures: <ul style="list-style-type: none"> • Creation • Initialization • Operations with data structures • Searches and processing in different data structures • Memory management 	<p><u>Student:</u></p> <ul style="list-style-type: none"> • Identifies characteristics of the OOP elements in context. • Recognizes procedures for declaration, invocation and execution of OOP elements. • Applies OOP principles of structure implementation. • Exemplifies principle for the implementation of structures. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Use principles and fundamentals of object oriented programming as tools for specific problem solving.	<ul style="list-style-type: none"> • Inheritance: <ul style="list-style-type: none"> • Base Class • Extending classes • Relation among classes • Constructors and destroyers • Polymorphism: <ul style="list-style-type: none"> • Relations among objects • Types and structures fields • Abstract classes • Constructors and destroyers • E/E Operations • Exceptions Management 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Demonstrates strategies for implementation of inheritance concepts and polymorphism in applications. • Demonstrates use and implementation of E/E operations. • Demonstrates procedures for the management of exceptions. 	<ul style="list-style-type: none"> • Effort to achieve a goal individually or by engaging the help of others. 	<ul style="list-style-type: none"> • Uses principles and fundamentals of object oriented programming as tools for specific problem solving.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<p><u>Student:</u></p> <ul style="list-style-type: none"> • Implements inheritance and polymorphism concepts in applications. • Implements E/E operations. • Applies procedures for exceptions management. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
3. Develop different applications using OOP principles.	<ul style="list-style-type: none"> • OOP in visual program language: <ul style="list-style-type: none"> • Declaration of variables and constants • Declaration of data structures • Program body <ul style="list-style-type: none"> • Functions or procedures • Implementation of control structures • Programming stages: <ul style="list-style-type: none"> • Design • Encoding • Compilation • Proof and correction • Code debugger • Execution 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Identifies stages of the creation process of a OOP program. • Describes programming techniques and good practices. • Exemplifies methods for declaration and encoding of different OOP elements. • Demonstrates procedures for OOP construction. 	<ul style="list-style-type: none"> • Effort to achieve a goal individually or by engaging the help of others. 	<ul style="list-style-type: none"> • Develop different applications using OOP principles .

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> • Identifies process stages for the creation of a OOP program • Applies programming techniques and good practices. • Uses methods for declaration and encoding of different OOP elements. • Uses procedures for OOP construction. 		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Object Oriented Programming

PRACTICE No. 1

Purpose:

Scenario: Computer Lab

Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures:

Teacher:

- Defines OOP concepts in programming context.
- Describes procedures for declaration, invocation and execution of OOP elements.
- Illustrates the strategies for use and application of OOP elements.
- Exemplifies principle for implementation of structures.
- Demonstrates strategies for implementation of inheritance concepts and polymorphism in applications.
- Demonstrates use and implementation of E/E operations.
- Demonstrates procedures for the management of exceptions.
- Identifies stages of the creation process of a OOP program.
- Describes programming techniques and good practices.
- Exemplifies methods for declaration and encoding of different OOP elements.
- Demonstrates procedures for OOP construction.

RECOMMENDED CHECKLIST

Date:

Student's name:

Instructions:

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

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Correctly identifies characteristics of the OOP elements in context.			
Effectively recognizes procedures for declaration, invocation and execution of OOP elements.			
Correctly applies OOP principles of structure implementation.			
Accurately exemplifies principle for the implementation of structures.			
Adequately implements inheritance and polymorphism concepts in applications.			
Correctly implements E/E operations.			
Effectively applies procedures for exceptions management.			
Clearly identifies process stages for the creation of a OOP program			
Accurately applies programming techniques and good practices.			
Adequately uses methods for declaration and encoding of different OOP elements.			
Effectively uses procedures for OOP construction.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Apply object oriented programming concepts in problem solving.	Applies object oriented programming concepts in problem solving.	Identifies characteristics of the OOP elements in context.	Knowledge	Correctly identifies characteristics of the OOP elements in context.
		Recognizes procedures for declaration, invocation and execution of OOP elements.	Knowledge	Effectively recognizes procedures for declaration, invocation and execution of OOP elements.
		Applies OOP principles of structure implementation.	Performance	Correctly applies OOP principles of structure implementation.
		Exemplifies principle for the implementation of structures.	Product	Accurately exemplifies principle for the implementation of structures.
Use principles and fundamentals of object oriented programming as tools for specific problem solving.	Uses principles and fundamentals of object oriented programming as tools for specific problem solving.	Implements inheritance and polymorphism concepts in applications.	Product	Adequately implements inheritance and polymorphism concepts in applications.
		Implements E/E operations.	Product	Correctly implements E/E operations.
		Applies procedures for exceptions management.	Performance	Effectively applies procedures for exceptions management.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Develop different applications using OOP principles.	Develops different applications using OOP principles.	Identifies the process stages for the creation of a OOP program	Knowledge	Clearly identifies process stages for the creation of a OOP program
		Applies the programming techniques and good practices.	Performance	Accurately applies programming techniques and good practices.
		Utilizes the methods for declaration and encoding of different OOP elements.	Performance	Adequately uses methods for declaration and encoding of different OOP elements.
		Utilizes the procedures for OOP construction.	Product	Effectively uses procedures for OOP construction.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Quality Culture
 Purpose: Distinguish the main aspects related to quality and customer service.
 Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly states the concepts associated to quality.	Specific
Clearly explains the importance of quality within the process of globalization.	Specific
Adequately identifies the benefits provided by a change towards quality.	Specific
Effectively uses the different tools in specific cases.	Specific
Accurately describes the factors that determine the customer's behavior.	Specific
Effectively distinguishes the way in which the customer's needs and expectations are presented.	Specific
Adequately recognizes the consequences to the company of not satisfying the customer.	Specific
Correctly indicates the basic principles of customer service.	Specific
Effectively identifies the characteristics of groups and teams.	Specific
Adequately recognizes the characteristics of groups and teams.	Specific
Effectively distinguishes the attitudes and personal values required for team work and negotiation.	Specific
Correctly explains the circumstances and elements that may influence team work.	Specific

Competency Elements

Reference	Title of the element
1-6	Main aspects related to quality and customer service.

Performance criteria:

1. Relates basic principles of quality with the development of daily tasks of a Computer systems technician.

2. Applies the concepts associated to customer service in the tasks performance related to a computer systems technician.
3. Recognizes the contributions of team work to achieve the target goals.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance Evidence:

1. Explains the importance of quality within the process of globalization.
2. Identifies the benefits provided by a change towards quality.
3. Uses the different tools in specific cases.
4. Describes the factors that determine the customer's behavior.
5. Distinguishes the way in which the customer's needs and expectations are presented.
6. Explains the service cycle and each moments of the truth.
7. Recognizes the consequences to the company of not satisfying the customer.
8. Distinguishes the attitudes and personal values required for team work and negotiation.
9. Indicates the differences between groups and teams.

Knowledge Evidence:

1. States the concepts associated to quality.
2. Indicates the basic principles of customer service.
3. Identifies the characteristics of groups and teams.
4. Recognizes the characteristics of groups and teams.

Product Evidence:

1. Classifies the types of customers.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Eleventh
Study block: Quality Culture	Time: 54 hours
Purpose: Distinguish the main aspects related to quality and customer service.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Relate basic principles of quality with the development of daily tasks of a Computer systems technician.	<ul style="list-style-type: none"> • Quality: <ul style="list-style-type: none"> • Concept • Characteristics • Quality in different fields: <ul style="list-style-type: none"> • Personal • Family • Community • Professional • Importance within the context of globalization: <ul style="list-style-type: none"> • Benefits • The change toward quality 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines the concepts associated with quality. • Shows the benefits provided by a change towards quality. • Establishes the importance of measurement to reach quality. • Explains the importance of statistical control. • Exemplifies the use of the methods in specific cases of the Program. 	<ul style="list-style-type: none"> • Respect: clearness regarding each person. 	<ul style="list-style-type: none"> • Relates basic principles of quality with the development of daily tasks of a Computer systems technician.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Continuous improvement: <ul style="list-style-type: none"> • Concept • Importance in the measurement of quality • Statistical • Quality control • Tools for Continuous improvement: <ul style="list-style-type: none"> • Brainstorming • Flux diagram • Cause-effect diagram • Pareto chart 	<p><u>Student:</u></p> <ul style="list-style-type: none"> • States the concepts associated to quality. • Explains the importance of quality within the process of globalization. • Identifies the benefits provided by a change towards quality. • Uses the different tools in specific cases. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Applies the concepts associated to customer service in the tasks performance related to a computer systems technician.	<ul style="list-style-type: none"> • Customer: <ul style="list-style-type: none"> • Concept • Characteristics • Conditioning factors • Needs and expectations • Customer satisfaction: <ul style="list-style-type: none"> • Customer classification • The service cycle (moments of truth). • Consequences of not satisfying the customer • Human relations : <ul style="list-style-type: none"> • Concept • Empathy • Values • Etiquette and protocol: <ul style="list-style-type: none"> • Rules of conduct in the: <ul style="list-style-type: none"> • community • company 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines the concepts related to the customer. • Exemplifies the consequences to a company for not satisfying the customer. • Identifies the processes by which human relations are established. • Explains the relationship between values and human relations. 	<ul style="list-style-type: none"> • Respect: clearness regarding each person. 	<ul style="list-style-type: none"> • Applies the concepts associated to customer service in the tasks performance related to a computer systems technician.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Basic norms for establishment of interpersonal relationships • Hierarchies and norms of conduct • Customer service: <ul style="list-style-type: none"> • Concept • Characteristics • Importance • Fundamental principles 	<p><u>Student:</u></p> <ul style="list-style-type: none"> • Describes the factors that determine the customer's behavior. • Distinguishes the way in which the customer's needs and expectations are presented. • Recognizes the consequences to the company of not satisfying the customer. • Indicates the basic principles of customer service. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
3. Recognize the contribution of team work to achieve the target goals.	<ul style="list-style-type: none"> • Team work: <ul style="list-style-type: none"> • Concept • Characteristics • Importance • Attitudes and personal values necessary for team work • Elements that influence work • Group: <ul style="list-style-type: none"> • Concept • Characteristics • Difference between groups and teams • Negotiation <ul style="list-style-type: none"> • Concept • Characteristics • Principles • Attitudes and personal values necessary for the negotiation 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Identifies the characteristics of groups and teams. • Describes the characteristics of groups and teams. • Explains the circumstances and elements that may influence team work. • Exemplifies team work process and efficient negotiation. 	<ul style="list-style-type: none"> • Respect: clearness regarding each person. 	<ul style="list-style-type: none"> • Recognizes the contributions of team work to achieve the target goals.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<p><u>Student:</u></p> <ul style="list-style-type: none"> • Identifies the characteristics of groups and teams. • Recognizes the characteristics of groups and teams. • Distinguishes the attitudes and personal values required for team work and negotiation. • Explains the circumstances and elements that may influence team work. 		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Quality Culture

PRACTICE No. 1

Purpose:

Scenario: Classroom

Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:

- Defines the concepts associated with quality.
- Shows the benefits provided by a change towards quality.
- Establishes the importance of measurement to reach quality.
- Explains the importance of statistical control.
- Exemplifies the use of the methods in specific cases of the Program.
- Defines the concepts related to the customer.
- Exemplifies the consequences to a company for not satisfying the customer.
- Identifies the processes by which human relations are established.
- Explains the relationship between values and human relations.
- Identifies the characteristics of groups and teams.
- Describes the characteristics of groups and teams.
- Explains the circumstances and elements that may influence team work.
- Exemplifies team work process and efficient negotiation.

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 states the concepts associated to quality.			
Clearly explains the importance of quality within the process of globalization.			
Adequately identifies the benefits provided by a change towards quality.			
Effectively uses the different tools in specific cases.			
Accurately describes the factors that determine the customer's behavior.			
Effectively distinguishes the way in which the customer's needs and expectations are presented.			
Adequately recognizes the consequences to the company of not satisfying the customer.			
Correctly indicates the basic principles of customer service.			
Effectively identifies the characteristics of groups and teams.			
Adequately recognizes the characteristics of groups and teams.			
Effectively distinguishes the attitudes and personal values required for team work and negotiation.			
Correctly explains the circumstances and elements that may influence team work.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Relate basic principles of quality with the development of daily tasks of a Computer systems technician.	Relates basic principles of quality with the development of daily tasks of a Computer systems technician.	States the concepts associated to quality	knowledge	Correctly states the concepts associated to quality.
		Explains the importance of quality within the process of globalization	Performance	Clearly explains the importance of quality within the process of globalization.
		Identifies the benefits provided by a change towards quality	Performance	Adequately identifies the benefits provided by a change towards quality.
		Uses the different tools in specific cases	Performance	Effectively uses the different tools in specific cases.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Applies the concepts associated to customer service in the tasks performance related to a computer systems technician.	Applies the concepts associated to customer service in the tasks performance related to a computer systems technician.	Describes the factors that determine the customer's behavior.	Performance	Accurately describes the factors that determine the customer's behavior.
		Distinguishes the way in which the customer's needs and expectations are presented.	Product	Effectively distinguishes the way in which the customer's needs and expectations are presented.
		Recognizes the consequences to the company of not satisfying the customer.	Performance	Adequately recognizes the consequences to the company of not satisfying the customer.
		Indicates the basic principles of customer service.	Performance	Correctly indicates the basic principles of customer service.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Recognize the contribution of team work to achieve the target goals.	Recognizes the contributions of team work to achieve the target goals.	Identifies the characteristics of groups and teams.	knowledge	Effectively identifies the characteristics of groups and teams.
		Recognizes the characteristics of groups and teams.	knowledge	Adequately recognizes the characteristics of groups and teams.
		Distinguishes the attitudes and personal values required for team work and negotiation.	Performance	Effectively distinguishes the attitudes and personal values required for team work and negotiation.
		Explains the circumstances and elements that may influence team work.	Performance	Correctly explains the circumstances and elements that may influence team work.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Marketing
 Purpose: Apply marketing principles in software design.
 Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly mentions concepts related to marketing.	Specific
Clearly recognizes determining components and elements.	Specific
Adequately describes advertising principles.	Specific
Effectively identifies determining advertising components and elements.	Specific
Accurately mentions basic concepts associated with each stage of marketing.	Specific
Effectively describes determining principles of each stage.	Specific
Adequately recognizes procedure for the design and implementation of each stage.	Specific
Correctly identifies strategies for success in each of the stages of marketing.	Specific
Effectively identifies media characteristics.	Specific
Adequately describes the most common media strategies.	Specific
Effectively recognizes determining principles in the media.	Specific
Correctly identifies the use of the message in media.	Specific

Competency Elements

Reference	Title of the element
1-7	Apply marketing principles in software design.

Performance criteria:

- Identifies the concepts and fundamentals of marketing in the context of software development.
- Distinguishes marketing stages as applied to software development.
- Applies marketing principles in defining the target population of a software product.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance Evidence:

1. Recognizes determining components and elements.
2. Describes advertising principles.
3. Recognizes procedure for the design and implementation of each stage.
4. Recognizes determining principles in the media.

Knowledge Evidence:

1. Mentions concepts related to marketing.
2. Identifies determining advertising components and elements.
3. Describes determining principles of each stage.
4. Mentions basic concepts associated with each stage of marketing.
5. Identifies media characteristics.
6. Describes the most common media strategies.
7. Identifies the use of the message in media.

Product Evidence:

1. Uses strategies for success in each of the stages of marketing.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Eleventh
Study block: Marketing	Time: 54 hours
Purpose: Apply marketing principles in software design.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Identify the concepts and fundamentals of marketing in the context of software development.	<ul style="list-style-type: none"> • Marketing: <ul style="list-style-type: none"> • Concepts • Features • Principles • Features • Components • Elements involved in target market • Marketing strategies • Advertising <ul style="list-style-type: none"> • Concept • Features • Principles • Influential elements • Marketing Advertising 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines concepts related to marketing. • Explains its determining components and elements. • Illustrates most commonly used marketing strategies. • Compares features and functions of marketing with advertising. 	<ul style="list-style-type: none"> • Learn to get something alone or with the help from others. 	<ul style="list-style-type: none"> • Identifies concepts and fundamentals of marketing in the context of software development.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student:</u> <ul style="list-style-type: none"> • Mentions concepts related to marketing. • Recognizes determining components and elements. • Describes advertising principles. • Identifies determining advertising components and elements. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Distinguish marketing stages as applied to software development.	<ul style="list-style-type: none"> • Stages of marketing: <ul style="list-style-type: none"> • Company history and product • Assessment • Product • Consumer assessment • Variables consumption • Competitive assessment • Marketing Objectives • Budget 	<u>Teacher</u> <ul style="list-style-type: none"> • Defines basic concepts associated with each stage of marketing. • Describes determining principles of each of its stages. • Explains procedures for design and implementation of each stage. • Uses case studies to illustrate the implementation of each stage 	<ul style="list-style-type: none"> • Learn to get something alone or with the help from others. 	<ul style="list-style-type: none"> • Distinguishes marketing stages implemented in software development.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<u>Student</u> <ul style="list-style-type: none"> • Mentions basic concepts associated with each stage of marketing. • Describes determining principles of each stage. • Recognizes procedure for the design and implementation of each stage. • Uses strategies for success in each of the stages of marketing. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
3. Apply marketing principles in defining the target population of a software product.	<ul style="list-style-type: none"> • Advertising: <ul style="list-style-type: none"> • Concept • Features • Strategies used • Principles • Ethics • Types advertising: <ul style="list-style-type: none"> • Television • Radio • Printed matter • Billboards • Cinema • E-mail • Internet • Others • Messages used in advertising media 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Identifies characteristics of media • Describes the most common strategies used in communication media • Explains determining principles of work in this field. • Illustrates the use of the message in communication media <p><u>Student:</u></p> <ul style="list-style-type: none"> • Identifies media characteristics. • Describes the most common media strategies. • Recognizes determining principles in the media. • Identifies the use of the message in media. 	<ul style="list-style-type: none"> • Learn to get something alone or with the help from others. 	<ul style="list-style-type: none"> • Applies marketing principles in defining the target population of a software product.

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Marketing

PRACTICE No. 1

Purpose:

Scenario: Classroom

Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:

- Defines concepts related to marketing.
- Explains its determining components and elements.
- Illustrates most commonly used marketing strategies.
- Compares features and functions of marketing with advertising.
- Defines basic concepts associated with each stage of marketing.
- Describes determining principles of each of its stages.
- Explains procedures for design and implementation of each stage.
- Uses case studies to illustrate the implementation of each stage.
- Identifies characteristics of media.
- Describes the most common strategies used in communication media.
- Explains determining principles of work in this field.
- Illustrates the use of the message in communication media.

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 related to marketing.			
Clearly recognizes determining components and elements.			
Adequately describes advertising principles.			
Effectively identifies determining advertising components and elements.			
Accurately mentions basic concepts associated with each stage of marketing.			
Effectively describes determining principles of each stage.			
Adequately recognizes procedure for the design and implementation of each stage.			
Correctly uses strategies for success in each of the stages of marketing.			
Effectively identifies media characteristics.			
Adequately describes the most common media strategies.			
Effectively recognizes determining principles in the media.			
Correctly identifies the use of the message in media.			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify the concepts and fundamentals of marketing in the context of software development.	Identifies the concepts and fundamentals of marketing in the context of software development.	Mentions concepts related to marketing.	knowledge	Correctly mentions concepts related to marketing.
		Recognizes determining components and elements.	Performance	Clearly recognizes determining components and elements.
		Describes advertising principles.	Performance	Adequately describes advertising principles.
		Identifies determining advertising components and elements.	knowledge	Effectively identifies determining advertising components and elements.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Distinguish marketing stages as applied to software development.	Distinguishes marketing stages as applied to software development.	Mentions basic concepts associated with each stage of marketing.	knowledge	Accurately mentions basic concepts associated with each stage of marketing.
		Describes determining principles of each stage.	knowledge	Effectively describes determining principles of each stage.
		Recognizes procedure for the design and implementation of each stage.	Performance	Adequately recognizes procedure for the design and implementation of each stage.
		Uses strategies for success in each of the stages of marketing.	Product	Correctly uses strategies for success in each of the stages of marketing.

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Apply marketing principles in defining the target population of a software product.	Applies marketing principles in defining the target population of a software product.	Identifies media characteristics.	knowledge	Effectively identifies media characteristics.
		Describes the most common media strategies.	knowledge	Adequately describes the most common media strategies.
		Recognizes determining principles in the media.	Performance	Effectively recognizes determining principles in the media.
		Identifies the use of the message in media.	knowledge	Correctly identifies the use of the message in media.

TECHNICAL COMPETENCY STANDARDS OF EDUCATIONAL INSTITUTION

GENERAL DATA

Title: Management of Computer Projects
 Purpose: Manage and develop computer projects.
 Competency level: Basic

UNITS OF JOB COMPETENCY THAT CONFORM THE STANDARDS

Title	Classification
Correctly mentions fundamental concepts of project management.	Specific
Clearly recognizes project characteristics.	Specific
Adequately applies techniques to select the life cycle of a project	Specific
Effectively learns basic concepts related to the management process and development of projects.	Specific
Accurately mentions fundamental concepts of project management.	Specific
Effectively recognizes project characteristics.	Specific
Adequately applies techniques to select the life cycle of a project	Specific
Correctly learns basic concepts related to the management process and development of projects.	Specific
Effectively mentions fundamental concepts of project management.	Specific
Adequately recognizes project characteristics.	Specific
Effectively applies techniques to select the life cycle of a project	Specific

Competency Elements

Reference	Title of the element
2-8	Manage and develop computer projects.

Performance criteria:

1. Identifies basic elements in the management project.
2. Recognizes elements that integrate the stages and components of software project management process.
3. Applies fundamental principles related to management and development of projects.

Application Field:

Category	Classes
Services	Provision of Technical Education Services

Performance Evidence:

1. Recognizes project characteristics.
2. Applies techniques to select the life cycle of a project.
3. Learns basic concepts related to the management process and development of projects.
4. Applies strategies for implementing each component of the process.
5. Applies basic determining principles of layout and project presentation.
6. Applies strategies for documentation projects.

Knowledge Evidence:

1. Mentions fundamental concepts of project management.
2. Identifies characteristics of each component of management and development process in projects.
3. Recognizes basic criteria for the formulation of each component of a computer project.

Product Evidence:

1. Creates each component of the process.
2. Develops specific projects.

Sector: Commercial and Services	Program: Computer Science in Software Development
Subject area: Programming	Grade: Eleventh
Study block: Management of Computer Projects	Time: 126 hours
Purpose: Manage and develop computer projects.	

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
1. Identify basic elements in the management of projects.	<ul style="list-style-type: none"> • Computer Projects: <ul style="list-style-type: none"> • Concept • Features • Mistakes made in programming of a computer project • Risk management • Project Life Cycle: <ul style="list-style-type: none"> • Concept • Features 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Defines fundamental concepts of project management. • Identifies common characteristics and errors in projects. • Illustrates techniques for choosing the life cycle of a project 	<ul style="list-style-type: none"> • Understand clearly every person's fundamental rights. 	<ul style="list-style-type: none"> • Identifies basic elements in the management project.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Types of project design: <ul style="list-style-type: none"> • Waterfall • Prototyping • Delivery in stages • Evolutionary Delivery • Other • Selection of the life cycle for a project 	<u>Student</u> <ul style="list-style-type: none"> • Mentions fundamental concepts of project management. • Recognizes project characteristics. • Applies techniques to select the life cycle of a project 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
2. Recognize elements that integrate the stages and components of software project management process.	<ul style="list-style-type: none"> • Estimate: <ul style="list-style-type: none"> • Concept • Features • Classes: <ul style="list-style-type: none"> • Size, Effort • Plan, Refinement • Technical • Planning: <ul style="list-style-type: none"> • Concept • Features • Objectives • Strategies • Customer-oriented development: <ul style="list-style-type: none"> • Concept • Features • Objectives • Principles • Quality Control: <ul style="list-style-type: none"> • Concept • Features • Objectives Strategies: <ul style="list-style-type: none"> • Motivation • Teamwork • Negotiation 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Identifies characteristics of each component of the developmental process and project management software. • Describes basic determining principles of each component of the developmental process and software project management. • Illustrates strategies for implementing each component. Makes each component of the process. 	<ul style="list-style-type: none"> • Understand clearly every person's fundamental rights. 	<ul style="list-style-type: none"> • Recognizes elements that integrate the stages and components of software project management process.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
	<ul style="list-style-type: none"> • Tools to increase productivity: <ul style="list-style-type: none"> • Concept • Features • Objectives • Implementation Strategies: <ul style="list-style-type: none"> • Budget • Concept • Features • Objectives • Types Strategies 	<p><u>Student:</u></p> <ul style="list-style-type: none"> • Learns basic concepts related to the management process and development of projects. • Identifies characteristics of each component of management and development process in projects. • Applies strategies for implementing each component of the process. • Creates each component of the process. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
3. Apply fundamental principles related to management and development of projects.	<ul style="list-style-type: none"> • Computer Projects: <ul style="list-style-type: none"> • Components for processing • Aspects of design and layout • Documentation 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Identifies basic criteria for the formulation of each component of a computer project. • Describes basic determining principles of layout and project presentation. • Illustrates strategies for documentation projects. • Illustrates elements considered in developing various computer projects. 	<ul style="list-style-type: none"> • Understand clearly every person's fundamental rights. 	<ul style="list-style-type: none"> • Applies fundamental principles related to management and development of projects.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<p><u>Student:</u></p> <ul style="list-style-type: none"> • Recognizes basic criteria for the formulation of each component of a computer project. • Applies basic determining principles of layout and project presentation. • Applies strategies for documentation projects. • Develops specific IT projects. 		

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
4. Apply skills, abilities, and knowledge related to software project management in an internship.	<ul style="list-style-type: none"> • Internships 	<p><u>Teacher:</u></p> <ul style="list-style-type: none"> • Explains importance of internships in companies. • Indicates philosophy of internships. • Describes experiences in each job position area responsibility of the company. • Plans an internship at local businesses, coordinating with technical coordinators and company director. 	<ul style="list-style-type: none"> • Understand clearly every person's fundamental rights. 	<ul style="list-style-type: none"> • Applies skills, abilities, and knowledge related to software project management in an internship.

LEARNING RESULTS	CONTENTS	TEACHING - LEARNING STRATEGIES	VALUES AND ATTITUDES	PERFORMANCE CRITERIA
		<p><u>Student:</u></p> <ul style="list-style-type: none"> • Discusses importance of internships in companies. • Identifies the philosophy of an internship. • Makes a report of experiences in the company. • Organizes an internship in a company environment, coordinating with technical coordinators, business and director. 		

PRACTICE AND CHECKLIST

PRACTICE DEVELOPMENT

Study Block: Management of Computer Projects | PRACTICE No. 1

Purpose:

Scenario: Classroom | Time:

MATERIALS	MACHINERY	EQUIPMENT	TOOLS

Procedures

Teacher:

- Defines fundamental concepts of project management.
- Identifies common characteristics and errors in projects.
- Illustrates techniques for choosing the life cycle of a project.
- Identifies characteristics of each component of the developmental process and project management software.
- Describes basic determining principles of each component of the developmental process and software project management.
- Illustrates strategies for implementing each component.
- Makes each component of the process .
- Identifies basic criteria for the formulation of each component of a computer project.
- Describes basic determining principles of layout and project presentation.
- Illustrates strategies for documentation projects.
- Illustrates elements considered in developing various computer projects.

RECOMMENDED CHECKLIST

Date:

Student's name:

Instructions:

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

DEVELOPMENT	YES	NOT YET	NOT APPLICABLE
Correctly mentions fundamental concepts of project management.			
Clearly recognizes project characteristics.			
Adequately applies techniques to select the life cycle of a project			
Effectively learns basic concepts related to the management process and development of projects.			
Accurately mentions fundamental concepts of project management.			
Effectively recognizes project characteristics.			
Adequately applies techniques to select the life cycle of a project			
Correctly learns basic concepts related to the management process and development of projects.			
Effectively mentions fundamental concepts of project management.			
Adequately recognizes project characteristics.			
Effectively applies techniques to select the life cycle of a project			

OBSERVATIONS:

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Identify basic elements in the management of projects.	Identifies basic elements in the management of projects.	Mentions fundamental concepts of project management.	knowledge	Correctly mentions fundamental concepts of project management.
		Recognizes project characteristics.	Performance	Clearly recognizes project characteristics.
		Applies techniques to select the life cycle of a project	Performance	Adequately applies techniques to select the life cycle of a project
Recognize elements that integrate the stages and components of software project management process.	Recognizes elements that integrate the stages and components of software project management process.	Learns basic concepts related to the management process and development of projects.	Performance	Effectively learns basic concepts related to the management process and development of projects.
		Identifies characteristics of each component of management and development process in projects.	knowledge	Accurately mentions fundamental concepts of project management.
		Applies strategies for implementing each component of the process.	Performance	Effectively recognizes project characteristics.
		Creates component of the process.	Product	Adequately applies techniques to select the life cycle of a project

CRITERIA FOR COMPETENCY ASSESSMENT

LEARNING RESULTS	PERFORMANCE CRITERIA	EVIDENCE	TYPE	EVIDENCE OF SUFFICIENCIES
Apply fundamental principles related to management and development of projects.	Applies fundamental principles related to management and development of projects.	Recognizes basic criteria for the formulation of each component of a computer project.	knowledge	Correctly learns basic concepts related to the management process and development of projects.
		Applies basic determining principles of layout and project presentation.	Performance	Effectively mentions fundamental concepts of project management.
		Applies strategies for documentation projects.	Performance	Adequately recognizes project characteristics.
		Develops specific projects.	Product	Effectively applies techniques to select the life cycle of a project

SUB-ÁREA: INTERFACES GRÁFICAS DE USUARIO



SUB – ÁREA: INTERFACES GRÁFICAS DE USUARIO

DESCRIPCIÓN

La sub-área INTERFACES GRÁFICAS DE USUARIO, con 4 horas por semana, está integrada por las siguientes unidades de estudio:

- Principios de Diseño
- Teoría del Color
- Diseño Tipográfico y Composición Artística
- Diseño Digital
- Fotografía Digital
- Interfaz Gráfica de Usuario

PROPÓSITOS GENERALES

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

- Aplicar los conceptos, elementos y principios básicos del diseño en el desarrollo de proyectos específicos relacionados con la interfaz gráfica de usuario.
- Aplicar los principios y técnicas básicas de la composición artística en el diseño de proyectos relacionados con la interfaz gráfica de usuario.
- Utilizar diferentes software especializados para la digitalización y optimización de imágenes para la creación de proyectos relacionados con la interfaz gráfica de usuario.

DISTRIBUCION DE LAS UNIDADES DE ESTUDIO

INTERFACES GRÁFICAS DE USUARIO

Unidades	Nombre	Tiempo Estimado en horas	Tiempo estimado en semanas
I.	Principios de Diseño	12	3
II.	Teoría del Color	20	5
III.	Diseño Tipográfico y Composición Artística	32	8
IV.	Diseño Digital	32	8
V.	Fotografía Digital	24	6
VI.	Interfaz Gráfica de Usuario	40	10
	TOTAL	160	40

NORMA TÉCNICA DE INSTITUCIÓN EDUCATIVA

DATOS GENERALES

Titulo:	Principios de Diseño
Propósito:	Aplicar los Principios de Diseño en el desarrollo de diferentes proyectos.
Nivel de competencia:	Básica

UNIDADES DE COMPETENCIA LABORAL QUE CONFORMAN LA NORMA

Título	Clasificación
Identifica eficientemente los conceptos básicos asociados al diseño.	Específica
Reconoce con claridad los elementos que intervienen en el diseño.	Específica
Describe con exactitud los aspectos fundamentales de la composición artística.	Específica
Señala adecuadamente los aspectos más relevantes de las diferentes técnicas de presentación.	Específica
Identifica correctamente los principios del diseño tridimensional.	Específica
Reconoce eficientemente la forma en que se representan los elementos del diseño.	Específica
Sigue los procedimientos para realizar una composición artística sin margen de error.	Específica
Aplica las diferentes técnicas de presentación con eficacia.	Específica
Utiliza los principios que regulan el diseño en diferentes proyectos cumpliendo con las especificaciones técnicas.	Específica

Elementos de competencia

Referencia	Título del elemento
2.1	Aplicar los principios de diseño en el desarrollo de diferentes proyectos.

Criterios de desempeño:

1. Identifica los principales elementos y procesos considerados en el diseño y composición de elementos.
2. Aplica los principios de la teoría del color en el desarrollo de proyectos.

Campo de aplicación:

Categoría	Clase
Servicios	Prestación de servicios de Educación Técnica

Evidencias de desempeño:

1. Describe los aspectos fundamentales de la composición artística.
2. Señala los aspectos más relevantes de las diferentes técnicas de presentación.
3. Sigue los procedimientos para realizar una composición artística.
4. Aplica las diferentes técnicas de presentación.

Evidencias de producto:

1. Diferentes proyectos desarrollados utilizando los principios que regulan el diseño.

Evidencias de conocimiento:

1. Identifica los principios del diseño tridimensional.
2. Identifica los conceptos básicos asociados al diseño.
3. Reconoce los elementos que intervienen en el diseño.
4. Reconoce la forma en que se representan los elementos del diseño.

Modalidad: Comercial y de Servicios	Especialidad: Computer Science in Software Development
Sub-área: Interfaces Gráficas de Usuario	Año: Undécimo
Unidad de Estudio: Principios de Diseño	Tiempo Estimado: 12 horas
Propósito: Aplicar los Principios de Diseño en el desarrollo de diferentes proyectos.	

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
1. Identificar los conceptos, elementos y procesos fundamentales del diseño.	<ul style="list-style-type: none"> • Diseño: <ul style="list-style-type: none"> • Concepto • Procesos. • Elementos del diseño: <ul style="list-style-type: none"> • Punto, Línea • Color, Contraste • Textura, • Proporción • Ritmo, Movimiento • Equilibrio. • Composición artística. • Técnicas de presentación. • Principios del diseño tridimensional. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Define los conceptos básicos asociados al diseño. • Explica los aspectos fundamentales de la composición artística. • Describe los aspectos más relevantes de las diferentes técnicas de presentación. • Ilustra los diferentes elementos del diseño. 	<ul style="list-style-type: none"> • Tener conciencia de todo aquello que nos rodea con la capacidad de anticiparse a los hechos. 	<ul style="list-style-type: none"> • Identifica los principales elementos y procesos considerados en el diseño y composición de elementos.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Identifica los conceptos básicos asociados al diseño. • Reconoce los elementos que intervienen en el diseño. • Identifica los principios del diseño tridimensional. • Reconoce los diferentes elementos del diseño. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
2. Aplicar los principios fundamentales que regulan el diseño.	<ul style="list-style-type: none"> • Elementos del diseño: <ul style="list-style-type: none"> • Punto • Línea • Color • Contraste • Textura • Proporción • Ritmo • Movimiento • Equilibrio. • Composición artística. • Técnicas de presentación. • Principios del diseño tridimensional. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Identifica la forma en que se representan los elementos que intervienen en el diseño. • Explica los procedimientos para realizar una composición artística. • Ilustra la aplicación de las diferentes técnicas de presentación. • Ejemplifica los principios que regulan el diseño. 	<ul style="list-style-type: none"> • Tener conciencia de todo aquello que nos rodea con la capacidad de anticiparse a los hechos. 	<ul style="list-style-type: none"> • Aplica los principios fundamentales que regulan el diseño.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Reconoce la forma en que se representan los elementos del diseño. • Sigue los procedimientos para realizar una composición artística. • Aplica las diferentes técnicas de presentación. • Utiliza los principios que regulan el diseño en diferentes proyectos. 		

PRÁCTICAS Y LISTAS DE COTEJO

DESARROLLO DE LA PRÁCTICA

UNIDAD DE ESTUDIO: Principios del Diseño PRÁCTICA No. 1

Propósito:

Escenario: Aula Duración:

MATERIALES	MAQUINARIA	EQUIPO	HERRAMIENTA

Procedimientos

El o la docente:

- Define los conceptos básicos asociados al diseño.
- Explica los aspectos fundamentales de la composición artística.
- Describe los aspectos más relevantes de las diferentes técnicas de presentación.
- Ilustra los diferentes elementos del diseño.
- Identifica la forma en que se representan los elementos que intervienen en el diseño.
- Explica los procedimientos para realizar una composición artística.
- Ilustra la aplicación de las diferentes técnicas de presentación.
- Ejemplifica los principios que regulan el diseño.

LISTA DE COTEJO SUGERIDA

Fecha:

Nombre del o la estudiante:

Instrucciones:

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

DESARROLLO	SI	NO	NO APLICA
Identifica eficientemente los conceptos básicos asociados al diseño.			
Reconoce con claridad los elementos que intervienen en el diseño.			
Identifica con exactitud los principios del diseño tridimensional.			
Reconoce adecuadamente los diferentes elementos del diseño.			
Reconoce eficientemente la forma en que se representan los elementos del diseño.			
Sigue los procedimientos para realizar una composición artística sin margen de error.			
Aplica las diferentes técnicas de presentación con eficacia.			
Utiliza los principios que regulan el diseño en diferentes proyectos cumpliendo con las especificaciones técnicas.			

OBSERVACIONES:

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Identificar los conceptos, elementos y procesos fundamentales del diseño.	Identifica los conceptos, elementos y procesos fundamentales del diseño.	Identifica los conceptos básicos asociados al diseño.	Conocimiento	Identifica eficientemente los conceptos básicos asociados al diseño.
		Reconoce los elementos que intervienen en el diseño.	Conocimiento	Reconoce con claridad los elementos que intervienen en el diseño.
		Identifica los principios del diseño tridimensional.	Desempeño	Identifica con exactitud los principios del diseño tridimensional.
		Reconoce los diferentes elementos del diseño.	Desempeño	Reconoce adecuadamente los diferentes elementos del diseño.
Aplicar los principios fundamentales que regulan el diseño.	Aplica los principios fundamentales que regulan el diseño.	Reconoce la forma en que se representan los elementos del diseño.	Conocimiento	Reconoce eficientemente la forma en que se representan los elementos del diseño.
		Sigue los procedimientos para realizar una composición artística.	Desempeño	Sigue los procedimientos para realizar una composición artística sin margen de error.

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
		Aplica las diferentes técnicas de presentación.	Desempeño	Aplica las diferentes técnicas de presentación con eficacia.
		Utiliza los principios que regulan el diseño en diferentes proyectos.	Producto	Utiliza los principios que regulan el diseño en diferentes proyectos cumpliendo con las especificaciones técnicas.

NORMA TÉCNICA DE INSTITUCIÓN EDUCATIVA

DATOS GENERALES

Titulo:	Teoría del Color
Propósito:	Utilizar los elementos fundamentales de la Teoría del Color en el diseño de diferentes proyectos.
Nivel de competencia:	Básica

UNIDADES DE COMPETENCIA LABORAL QUE CONFORMAN LA NORMA

Título	Clasificación
Reconoce con claridad los principales elementos de la historia del color.	Específica
Distingue correctamente los aspectos básicos relacionados con el espectro visible de la luz.	Específica
Explica con claridad la teoría relacionada con el círculo cromático.	Específica
Aplica los principios de psicología del color en el desarrollo de proyectos con eficacia.	Específica
Describe los elementos básicos para el trabajo con mezclas de color con eficiencia.	Específica
Aplica los elementos básicos del matiz, el valor y la intensidad con eficacia.	Específica
Utiliza los tipos y combinaciones de colores en el desarrollo de proyectos con eficiencia.	Específica
Aplica los principios de la teoría del color en el desarrollo de proyectos sin margen de error.	Específica
Identifica correctamente los conceptos relacionados con los modos del color.	Específica
Describe con claridad los elementos básicos para la aplicación de los modos de color en proyectos gráficos.	Específica
Reconoce los elementos básicos para la aplicación de los modos de color en proyectos gráficos con eficiencia.	Específica
Aplica los modos de color en proyectos gráficos con eficiencia.	Específica

Elementos de competencia

Referencia	Título del elemento
2.2.	Utilizar los elementos fundamentales de la teoría del color en el diseño de diferentes proyectos.

Criterios de desempeño:

1. Identifica los conceptos y elementos fundamentales relacionados con la teoría del color.
2. Aplica los principios básicos de la teoría del color en el desarrollo de proyectos.
3. Aplica los modos del color en proyectos de diseño.

Campo de aplicación:

Categoría	Clase
Servicios	Prestación de servicios de Educación Técnica

Evidencias de desempeño:

1. Explica la teoría relacionada con el círculo cromático.
2. Aplica los elementos básicos del matiz, el valor y la intensidad.
3. Reconoce los elementos básicos para la aplicación de los modos de color en proyectos gráficos.

Evidencias de producto:

1. Aplica los principios de psicología del color en el desarrollo de proyectos.
2. Utiliza los tipos y combinaciones de colores en el desarrollo de proyectos.
3. Aplica los principios de la teoría del color en el desarrollo de proyectos.
4. Aplica los modos de color en proyectos gráficos.

Evidencias de conocimiento:

1. Reconoce los principales elementos de la historia del color.
2. Distingue los aspectos básicos relacionados con el espectro visible de la luz.
3. Describe los elementos básicos para el trabajo con mezclas de color.
4. Identifica los conceptos relacionados con los modos del color.
5. Describe los elementos básicos para la aplicación de los modos de color en proyectos gráficos.

Modalidad: Comercial y de Servicios	Especialidad: Informática en Desarrollo de Software
Sub-área: Interfaces Gráficas de Usuario	Año: Undécimo
Unidad de Estudio: Teoría del Color	Tiempo Estimado: 20 horas
Propósito: Utilizar los elementos fundamentales de la teoría del color en el diseño de diferentes proyectos.	

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
1. Identificar los conceptos y elementos fundamentales relacionados con la teoría del color.	<ul style="list-style-type: none"> • Historia del color. • El matiz, el valor y la intensidad. • Elementos básicos para percibir el color. • El espectro visible de la luz. • El ojo y sus partes. • Mezclas del color: <ul style="list-style-type: none"> • Aditiva (RGB) • Sustractiva (CMY). • El círculo cromático. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Identifica los principales elementos de la historia del color. • Describe los elementos básicos para la percepción del color. • Describe las funciones y componentes del ojo humano y sus relaciones con la percepción del color. • Explica la teoría relacionada con el círculo cromático. 	<ul style="list-style-type: none"> • Tener conciencia de todo aquello que nos rodea con la capacidad de anticiparse a los hechos. 	<ul style="list-style-type: none"> • Identifica los conceptos y elementos fundamentales relacionados con la teoría del color.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
	<ul style="list-style-type: none"> • Colores: <ul style="list-style-type: none"> • Primarios • Secundarios • Complementarios • Cálidos • Fríos. • Combinaciones de colores. • Principios de psicología del color. 	<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Reconoce los principales elementos de la historia del color. • Distingue los aspectos básicos relacionados con el espectro visible de la luz. • Explica la teoría relacionada con el círculo cromático. • Aplica los principios de psicología del color en el desarrollo de proyectos. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
2. Aplicar los principios básicos de la Teoría del Color en el desarrollo de proyectos.	<ul style="list-style-type: none"> • El matiz, el valor y la intensidad. • Mezclas del color. • Colores: <ul style="list-style-type: none"> • Primarios • Secundarios • Complementarios • Cálidos • Fríos. • Combinaciones de colores. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Identifica los conceptos relacionados con el matiz, el valor y la intensidad. • Describe los elementos básicos para el trabajo con mezclas de color. • Ilustra los diferentes usos y aplicaciones de los tipos y combinaciones de colores con los que se puede trabajar. • Ejemplifica los diferentes principios de la teoría del color en el desarrollo de proyectos. 	<ul style="list-style-type: none"> • Tener conciencia de todo aquello que nos rodea con la capacidad de anticiparse a los hechos. 	<ul style="list-style-type: none"> • Aplica los principios básicos de la teoría del color en el desarrollo de proyectos.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Describe los elementos básicos para el trabajo con mezclas de color. • Aplica los elementos básicos del matiz, el valor y la intensidad. • Utiliza los tipos y combinaciones de colores en el desarrollo de proyectos. • Aplica los principios de la teoría del color en el desarrollo de proyectos. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
3. Aplicar los modos del color en proyectos de diseño.	<ul style="list-style-type: none"> • Colores: <ul style="list-style-type: none"> • Matiz • Saturación • Brillo • Tonalidad • Armonía. • Alteración del espacio por medio del color. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Identifica los conceptos relacionados con los modos del color. • Describe los elementos básicos para la aplicación de los modos de color en proyectos gráficos. • Ilustra los diferentes usos y aplicaciones de los modos de color en proyectos gráficos. • Ejemplifica los diferentes principios que se aplican en el desarrollo de proyectos gráficos. 	<ul style="list-style-type: none"> • Tener conciencia de todo aquello que nos rodea con la capacidad de anticiparse a los hechos. 	<ul style="list-style-type: none"> • Aplica los modos del color en proyectos de diseño.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Identifica los conceptos relacionados con los modos del color. • Describe los elementos básicos para la aplicación de los modos de color en proyectos gráficos. • Reconoce los elementos básicos para la aplicación de los modos de color en proyectos gráficos. • Aplica los modos de color en proyectos gráficos. 		

PRÁCTICAS Y LISTAS DE COTEJO

DESARROLLO DE LA PRÁCTICA

UNIDAD DE ESTUDIO: Teoría del Color

PRÁCTICA No. 1

Propósito:

Escenario: Aula

Duración:

MATERIALES	MAQUINARIA	EQUIPO	HERRAMIENTA

Procedimientos

El o la docente:

- Identifica los principales elementos de la historia del color.
- Describe los elementos básicos para la percepción del color.
- Describe las funciones y componentes del ojo humano y sus relaciones con la percepción del color.
- Explica la teoría relacionada con el círculo cromático.
- Identifica los conceptos relacionados con el matiz, el valor y la intensidad.
- Describe los elementos básicos para el trabajo con mezclas de color.
- Ilustra los diferentes usos y aplicaciones de los tipos y combinaciones de colores con los que se puede trabajar.
- Ejemplifica los diferentes principios de la teoría del color en el desarrollo de proyectos.
- Identifica los conceptos relacionados con los modos del color.
- Describe los elementos básicos para la aplicación de los modos de color en proyectos gráficos.
- Ilustra los diferentes usos y aplicaciones de los modos de color en proyectos gráficos.
- Ejemplifica los diferentes principios que se aplican en el desarrollo de proyectos gráficos.

LISTA DE COTEJO SUGERIDA

Fecha:

Nombre del o la estudiante:

Instrucciones:

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

DESARROLLO	SI	NO	NO APLICA
Reconoce con claridad los principales elementos de la historia del color.			
Distingue correctamente los aspectos básicos relacionados con el espectro visible de la luz.			
Explica con claridad la teoría relacionada con el círculo cromático.			
Aplica los principios de psicología del color en el desarrollo de proyectos con eficacia.			
Describe los elementos básicos para el trabajo con mezclas de color con eficiencia.			
Aplica los elementos básicos del matiz, el valor y la intensidad con eficacia.			
Utiliza los tipos y combinaciones de colores en el desarrollo de proyectos con eficiencia.			
Aplica los principios de la teoría del color en el desarrollo de proyectos sin margen de error.			
Identifica correctamente los conceptos relacionados con los modos del color.			
Describe con claridad los elementos básicos para la aplicación de los modos de color en proyectos gráficos.			
Reconoce los elementos básicos para la aplicación de los modos de color en proyectos gráficos con eficiencia.			
Aplica los modos de color en proyectos gráficos con eficiencia.			

OBSERVACIONES:

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Identificar los conceptos y elementos fundamentales relacionados con la teoría del color.	Identifica los conceptos y elementos fundamentales relacionados con la teoría del color.	Reconoce los principales elementos de la historia del color.	Conocimiento	Reconoce con claridad los principales elementos de la historia del color.
		Distingue los aspectos básicos relacionados con el espectro visible de la luz.	Conocimiento	Distingue correctamente los aspectos básicos relacionados con el espectro visible de la luz.
		Explica la teoría relacionada con el círculo cromático.	Desempeño	Explica con claridad la teoría relacionada con el círculo cromático.
		Aplica los principios de psicología del color en el desarrollo de proyectos.	Producto	Aplica los principios de psicología del color en el desarrollo de proyectos con eficacia.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Aplicar los principios básicos de la teoría del color en el desarrollo de proyecto.	Aplica los principios de la teoría del color en el desarrollo de proyectos.	Describe los elementos básicos para el trabajo con mezclas de color.	Conocimiento	Describe los elementos básicos para el trabajo con mezclas de color con eficiencia.
		Aplica los elementos básicos del matiz, el valor y la intensidad.	Desempeño	Aplica los elementos básicos del matiz, el valor y la intensidad con eficacia.
		Utiliza los tipos y combinaciones de colores en el desarrollo de proyectos.	Producto	Utiliza los tipos y combinaciones de colores en el desarrollo de proyectos con eficiencia.
		Aplica los principios de la teoría del color en el desarrollo de proyectos.	Producto	Aplica los principios de la teoría del color en el desarrollo de proyectos sin margen de error.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Aplicar los modos del color en proyectos de diseño.	Aplica los modos del color en proyectos de diseño.	Identifica los conceptos relacionados con los modos del color.	Conocimiento	Identifica correctamente los conceptos relacionados con los modos del color.
		Describe los elementos básicos para la aplicación de los modos de color en proyectos gráficos.	Conocimiento	Describe con claridad los elementos básicos para la aplicación de los modos de color en proyectos gráficos.
		Reconoce los elementos básicos para la aplicación de los modos de color en proyectos gráficos.	Desempeño	Reconoce los elementos básicos para la aplicación de los modos de color en proyectos gráficos con eficiencia.
		Aplica los modos de color en proyectos gráficos.	Producto	Aplica los modos de color en proyectos gráficos con eficiencia.

NORMA TÉCNICA DE INSTITUCIÓN EDUCATIVA

DATOS GENERALES

Titulo:	Diseño Tipográfico y Composición Artística
Propósito:	Aplicar los principios de tipografía y composición artística en el diseño y desarrollo de diferentes tipos de proyectos.
Nivel de competencia:	Básica

UNIDADES DE COMPETENCIA LABORAL QUE CONFORMAN LA NORMA

Título	Clasificación
Identifica con precisión los hechos fundamentales relacionados con la escritura.	Específica
Reconoce los principales elementos de la tipografía sin margen de error.	Específica
Distingue los elementos básicos del diseño tipográfico sin margen de error.	Específica
Distingue correctamente las características y usos de los carteles, afiches y posters.	Específica
Identifica los elementos básicos del diseño tipográfico sin margen de error.	Específica
Describe las aplicaciones de los diferentes elementos gráficos a diseñar sin margen de error.	Específica
Reconoce con precisión los principios que rigen el diseño tipográfico en la confección de elementos gráficos.	Específica
Diseña diferentes elementos gráficos con eficiencia.	Específica
Reconoce correctamente el concepto de composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.	Específica
Identifica con precisión las características básicas de la composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.	Específica
Ilustra la presencia de elementos de expresión en las composiciones sin margen de error.	Específica

Elementos de competencia

Referencia	Título del elemento
2.3.	Aplicar los principios de tipografía y composición artística en el diseño y desarrollo de diferentes tipos de proyectos.

Criterios de desempeño:

1. Identifica los conceptos y elementos fundamentales relacionados con la tipografía.
2. Aplica los principios que rigen el diseño tipográfico en la confección de diferentes elementos gráficos.
3. Identifica los conceptos y técnicas fundamentales de la percepción y distribución espacial.

Campo de aplicación:

Categoría	Clase
Servicios	Prestación de servicios de Educación Técnica

Evidencias de desempeño:

1. Aplica los elementos básicos del diseño tipográfico.
2. Diferencia las características de las familias tipográficas.
3. Distingue las características y usos de los diferentes elementos gráficos.
4. Utiliza las aplicaciones de los diferentes elementos gráficos.
5. Ilustra la presencia de elementos de expresión en las composiciones.

Evidencias de producto:

1. Diferentes elementos gráficos.

Evidencias de conocimiento:

1. Define el concepto de tipografía.
2. Identifica los hechos fundamentales relacionados con la escritura.
3. Reconoce los principales elementos de la tipografía.
4. Identifica los principios que rigen el diseño tipográfico en la confección de diferentes elementos gráficos.
5. Reconoce el concepto de composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.
6. Identifica las características básicas de la composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.

Modalidad: Comercial y de Servicios	Especialidad: Computer Science in Software Development
Sub-área: Interfaces Gráficas de Usuario	Año: Undécimo
Unidad de Estudio: Diseño Tipográfico y Composición Artística	Tiempo Estimado: 32 horas
Propósito: Aplicar los principios de tipografía y composición artística en el diseño y desarrollo de diferentes tipos de proyectos.	

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
1. Identificar los conceptos y elementos fundamentales relacionados con la tipografía.	<ul style="list-style-type: none"> • Tipografía: • La escritura • Concepto • Elementos fundamentales • Diseño tipográfico • Familias tipográficas • Carteles, afiches y postres. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Explica los hechos fundamentales relacionados con la escritura. • Identifica los principales elementos de la tipografía. • Describe las características de las diferentes familias tipográficas. • Ilustra los tipos de carteles, afiches y posters. 	<ul style="list-style-type: none"> • Tener conciencia de todo aquello que nos rodea con la capacidad de anticiparse a los hechos. 	<ul style="list-style-type: none"> • Identifica los conceptos y elementos fundamentales relacionados con la tipografía.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Identifica los hechos fundamentales relacionados con la escritura. • Reconoce los principales elementos de la tipografía. • Distingue los elementos básicos del diseño tipográfico. • Distingue las características y usos de los carteles, afiches y posters. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
2. Aplicar los principios que rigen el diseño tipográfico en la confección de diferentes elementos gráficos.	<ul style="list-style-type: none"> • Elementos gráficos: <ul style="list-style-type: none"> • Portadas • Ventanas • Menú • Botones • Otros. • Diseño tipográfico: <ul style="list-style-type: none"> • Tipos de letras • Tamaños • Efectos de fuente • Otros. • Relación entre el elemento gráfico y el diseño tipográfico. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Describe los elementos básicos del diseño tipográfico. • Ilustra las aplicaciones de los diferentes elementos gráficos a diseñar. • Ejemplifica en diferentes tipos tipografía. • Diseña diferentes elementos gráficos. 	<ul style="list-style-type: none"> • Tener conciencia de todo aquello que nos rodea con la capacidad de anticiparse a los hechos. 	<ul style="list-style-type: none"> • Aplica los principios que rigen el diseño tipográfico en la confección de diferentes elementos gráficos.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Identifica los elementos básicos del diseño tipográfico. • Describe las aplicaciones de los diferentes elementos gráficos a diseñar. • Reconoce los principios que rigen el diseño tipográfico en la confección de elementos gráficos. • Diseña diferentes elementos gráficos. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
3. Identificar los conceptos y técnicas fundamentales de la percepción y distribución espacial.	<ul style="list-style-type: none"> • Composición artística: <ul style="list-style-type: none"> • Concepto • Características • Funciones y aplicaciones • Espacio • Real • Geométrico • Campo de fuerzas interdependientes • Equilibrio • Peso. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Define el concepto de composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio. • Identifica las características básicas de la composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio. • Ejemplifica la presencia de elementos de expresión en las composiciones. 	<ul style="list-style-type: none"> • Tener conciencia de todo aquello que nos rodea con la capacidad de anticiparse a los hechos. 	<ul style="list-style-type: none"> • Identifica los conceptos y técnicas fundamentales de la percepción y distribución espacial.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
	<ul style="list-style-type: none"> • Composiciones: <ul style="list-style-type: none"> • Dinámica • Estática. • Elementos de tensión. • Expresión. 	<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Reconoce el concepto de composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio. • Identifica las características básicas de la composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio. • Ilustra la presencia de elementos de expresión en las composiciones. 		

PRÁCTICAS Y LISTAS DE COTEJO

DESARROLLO DE LA PRÁCTICA

UNIDAD DE ESTUDIO: Diseño Tipográfico y Composición Artística PRÁCTICA No. 1

Propósito:

Escenario: Aula

Duración:

MATERIALES	MAQUINARIA	EQUIPO	HERRAMIENTA

Procedimientos

El o la docente:

- Explica los hechos fundamentales relacionados con la escritura.
- Identifica los principales elementos de la tipografía.
- Describe las características de las diferentes familias tipográficas.
- Ilustra los tipos de carteles, afiches y posters.
- Describe los elementos básicos del diseño tipográfico.
- Ilustra las aplicaciones de los diferentes elementos gráficos a diseñar.
- Ejemplifica en diferentes tipos tipografía.
- Diseña diferentes elementos gráficos.
- Define el concepto de composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.
- Identifica las características básicas de la composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.
- Ejemplifica la presencia de elementos de expresión en las composiciones.

LISTA DE COTEJO SUGERIDA

Fecha:

Nombre del o la estudiante:

Instrucciones:

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

DESARROLLO	SI	NO	NO APLICA
Identifica con precisión los hechos fundamentales relacionados con la escritura.			
Reconoce los principales elementos de la tipografía sin margen de error.			
Distingue los elementos básicos del diseño tipográfico sin margen de error.			
Distingue correctamente las características y usos de los carteles, afiches y posters.			
Identifica los elementos básicos del diseño tipográfico sin margen de error.			
Describe las aplicaciones de los diferentes elementos gráficos a diseñar sin margen de error.			
Reconoce con precisión los principios que rigen el diseño tipográfico en la confección de elementos gráficos.			
Diseña diferentes elementos gráficos con eficiencia.			
Reconoce correctamente el concepto de composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.			
Identifica con precisión las características básicas de la composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.			
Ilustra la presencia de elementos de expresión en las composiciones sin margen de error.			

OBSERVACIONES:

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Identificar los conceptos y elementos fundamentales relacionados con la tipografía.	Identifica los conceptos y elementos fundamentales relacionados con la tipografía.	Identifica los hechos fundamentales relacionados con la escritura.	Conocimiento	Identifica con precisión los hechos fundamentales relacionados con la escritura.
		Reconoce los principales elementos de la tipografía.	Conocimiento	Reconoce los principales elementos de la tipografía sin margen de error.
		Distingue los elementos básicos del diseño tipográfico.	Conocimiento	Distingue los elementos básicos del diseño tipográfico sin margen de error.
		Distingue las características y usos de los carteles, afiches y posters.	Desempeño	Distingue correctamente las características y usos de los diferentes elementos gráficos.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Aplicar los principios que rigen el diseño tipográfico en la confección de diferentes elementos gráficos.	Identifica los conceptos y elementos fundamentales relacionados con la tipografía.	Identifica los elementos básicos del diseño tipográfico.	Conocimiento	Identifica los elementos básicos del diseño tipográfico sin margen de error.
		Describe las aplicaciones de los diferentes elementos gráficos a diseñar.	Desempeño	Describe las aplicaciones de los diferentes elementos gráficos a diseñar sin margen de error.
		Reconoce los principios que rigen el diseño tipográfico en la confección de elementos gráficos.	Desempeño	Reconoce con precisión los principios que rigen el diseño tipográfico en la confección de elementos gráficos.
		Diseña diferentes elementos gráficos	Producto	Diseña diferentes elementos gráficos con eficiencia.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Identificar los conceptos y técnicas fundamentales de la percepción y distribución espacial.	Identifica los conceptos y técnicas fundamentales de la percepción y distribución espacial.	Reconoce el concepto de composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.	Conocimiento	Reconoce correctamente el concepto de composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.
		Identifica las características básicas de la composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.	Conocimiento	Identifica con precisión las características básicas de la composición artística, espacio campo de fuerzas interdependientes, peso y equilibrio.
		Ilustra la presencia de elementos de expresión en las composiciones.	Desempeño	Ilustra la presencia de elementos de expresión en las composiciones sin margen de error.

NORMA TÉCNICA DE INSTITUCIÓN EDUCATIVA

DATOS GENERALES

- Titulo: Diseño Digital
Propósito: Utilizar las funciones y herramientas existentes en diferentes herramientas especializadas para la edición y manipulación de imágenes.
Nivel de competencia: Básica

UNIDADES DE COMPETENCIA LABORAL QUE CONFORMAN LA NORMA

Título	Clasificación
Identifica correctamente las características principales de un software específico.	Específica
Reconoce eficientemente los usos y aplicaciones del un software específico.	Específica
Distingue los requerimientos de hardware que tiene el un software específico sin margen de error.	Específica
Reconoce la importancia del licenciamiento en el marco de la Ley de Propiedad Intelectual sin margen de error.	Específica
Describe correctamente los usos y aplicaciones de las paletas y menús del un software específico.	Específica
Reconoce con precisión las paletas y menús disponibles en un software específico.	Específica
Sigue el procedimiento para el uso de las paletas y menús del un software específico sin margen de error.	Específica
Utiliza con eficiencia las paletas y menús del un software específico.	Específica
Reconoce eficientemente los tipos de gráficos e imágenes con los que se puede trabajar.	Específica
Describe las fuentes desde las que se pueden capturar las diferentes imágenes sin margen de error.	Específica
Captura e imprime adecuadamente diferentes tipos de imágenes.	Específica
Aplica correctamente el procedimiento para la optimización de las imágenes.	Específica
Reconoce con eficiencia los tipos de ajustes en el color que se pueden realizar.	Específica
Identifica las herramientas disponibles para ajustar el color sin margen de error.	Específica
Sigue adecuadamente el procedimiento para realizar diferentes ajustes de color.	Específica
Utiliza las diferentes herramientas para el ajuste de color sin margen de error.	Específica

Título	Clasificación
Reconoce adecuadamente el concepto de preferencias y selecciones.	Específica
Identifica con eficiencia los tipos de preferencias y selecciones con los que se puede trabajar.	Específica
Sigue el procedimiento para el uso de preferencias y selecciones sin margen de error.	Específica
Aplica el procedimiento para el uso de preferencias y selecciones sin margen de error.	Específica
Reconoce correctamente el concepto de capas.	Específica
Identifica los tipos de capas sin margen de error.	Específica
Sigue correctamente el procedimiento para el uso de capas.	Específica
Aplica adecuadamente el procedimiento para el uso de capas sin margen de error.	Específica
Identifica correctamente las funciones con las que se puede trabajar el texto en un software específico.	Específica
Sigue correctamente el procedimiento para la edición, selección e importación de textos en un software específico.	Específica
Aplica el procedimiento para la edición, selección e importación de textos en un software específico sin margen de error.	Específica
Reconoce las funciones de un software específico para pintar y colorear.	Específica
Identifica las funciones y herramientas disponibles para crear motivos y texturas.	Específica
Utiliza criterios técnicos y estéticos para la selección de colores, fondos y texturas.	Específica
Sigue el procedimiento para pintar, colorear, crear motivos y texturas con un software específico sin margen de error.	Específica
Identifica con claridad los diferentes tipos de filtros que se pueden utilizar.	Específica
Describe correctamente las funciones y herramientas de un software específico para el uso de filtros.	Específica
Utiliza adecuadamente las funciones y herramientas disponibles para crear y utilizar filtros.	Específica
Aplica el procedimiento para crear y usar filtros con un software específico sin margen de error.	Específica
Elementos de competencia	
Referencia	Título del elemento
2.4.	Utilizar las funciones y herramientas existentes en el un software específico para la edición y manipulación de imágenes.
Criterios de desempeño:	

1. Identifica las funciones y herramientas disponibles en un software específico para la elaboración de diseños digitales.
2. Utiliza las herramientas disponibles con un software específico para diseño digital.
3. Reconoce los tipos de imágenes y ajustes de color que se pueden trabajar en el diseño gráfico con el apoyo de un software específico.
4. Utiliza las opciones de preferencias y selecciones del diseño digital por medio de un software específico.
5. Utiliza las herramientas y funciones para el manejo de capas, canales y máscaras de un software específico.
6. Utiliza las herramientas y funciones disponibles para el manejo de texto en un software específico.
7. Utiliza las herramientas disponibles para pintar y colorear con un software específico.
8. Utiliza las funciones y herramientas disponibles en un software específico para el uso de filtros.

Campo de aplicación:

Categoría	Clase
Servicios	Prestación de servicios de Educación Técnica

Evidencias de desempeño:

1. Reconoce los usos y aplicaciones del un software específico.
2. Reconoce la importancia del licenciamiento en el marco de la Ley de Propiedad Intelectual.
3. Reconoce las paletas y menús disponibles en un software específico.
4. Sigue el procedimiento para el uso de las paletas y menús del un software específico.
5. Describe las fuentes desde las que se pueden capturar las diferentes imágenes.
6. Sigue el procedimiento para realizar diferentes ajustes de color.
7. Sigue el procedimiento para el uso de preferencias y selecciones.
8. Sigue el procedimiento para el uso de capas
9. Sigue el procedimiento para la edición, selección e importación de textos en un software específico.
10. Sigue el procedimiento para pintar, colorear, crear motivos y texturas con un software específico.
11. Describe las funciones y herramientas de un software específico para el uso de filtros.

Evidencias de producto:

1. Utiliza las paletas y menús del un software específico.
2. Captura e imprime diferentes tipos de imágenes.
3. Aplica el procedimiento para la optimización de las imágenes.
4. Utiliza las diferentes herramientas para el ajuste de color.
5. Aplica el procedimiento para el uso de preferencias y selecciones.
6. Aplica el procedimiento para el uso de capas
7. Aplica el procedimiento para la edición, selección e importación de textos en un software específico.
8. Utiliza criterios técnicos y estéticos para la selección de colores, fondos y texturas.
9. Utiliza las funciones y herramientas disponibles para crear y utilizar filtros.
10. Aplica el procedimiento para crear y usar filtros con un software específico.

Evidencias de conocimiento:

1. Identifica las características principales de un software específico.
2. Distingue los requerimientos de hardware que tiene el un software específico.
3. Describe los usos y aplicaciones de las paletas y menús del un software específico.
4. Reconoce los tipos de gráficos e imágenes con los que se puede trabajar.
5. Reconoce los tipos de ajustes en el color que se pueden realizar.
6. Identifica las herramientas disponibles para ajustar el color.
7. Reconoce el concepto de preferencias y selecciones.
8. Identifica los tipos de preferencias y selecciones con los que se puede trabajar.
9. Reconoce el concepto de capas
10. Identifica los tipos de capas
11. Identifica las funciones con las que se puede trabajar el texto en un software específico.
12. Reconoce las funciones de un software específico para pintar y colorear.
13. Identifica las funciones y herramientas disponibles para crear motivos y texturas.
14. Identifica los diferentes tipos de filtros que se pueden utilizar.

Modalidad: Comercial y de Servicios	Especialidad: Computer Science in Software Development
Sub-área: Interfaces Gráficas de Usuario	Año: Undécimo
Unidad de Estudio: Diseño Digital	Tiempo Estimado: 32 horas
Propósito: Utilizar las funciones y herramientas existentes en el un software específico para la edición y manipulación de imágenes.	

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
1. Identificar las funciones y herramientas disponibles en un software específico para la elaboración de diseños digitales.	<ul style="list-style-type: none"> Software específico: <ul style="list-style-type: none"> Características Usos y aplicaciones Requerimientos de hardware Proceso de compra y licenciamiento del software. 	<u>El o la docente:</u> <ul style="list-style-type: none"> Identifica las características principales del un software específico. Describe los usos y aplicaciones del un software específico. Señala los requerimientos de hardware que tiene el un software específico. Examina la importancia del licenciamiento en el marco de la Ley de Propiedad Intelectual. 	<ul style="list-style-type: none"> Tener una clara noción de los derechos fundamentales de cada persona. 	<ul style="list-style-type: none"> Identifica las funciones y herramientas disponibles en un software específico para la elaboración de diseños digitales.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Identifica las características principales de un software específico. • Reconoce los usos y aplicaciones del un software específico. • Distingue los requerimientos de hardware que tiene el un software específico. • Reconoce la importancia del licenciamiento en el marco de la Ley de Propiedad Intelectual. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
2. Utilizar las herramientas disponibles con software específico para diseño digital.	<ul style="list-style-type: none"> • Paletas: <ul style="list-style-type: none"> • Opciones • Color • Muestras • Pinceles • Capas • Canales • Trazados. • Menús: <ul style="list-style-type: none"> • Archivo • Edición • Imagen • Capa • Selección • Filtro • Vista • Ventana • Ayuda. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Identifica las paletas y menús disponibles en el un software específico. • Describe los usos y aplicaciones de las paletas y menús del un software específico. • Explica el procedimiento para el uso de las paletas y menús del un software específico. • Ilustra las aplicaciones y usos de las paletas y menús del un software específico. 	<ul style="list-style-type: none"> • Tener una clara noción de los derechos fundamentales de cada persona. 	<ul style="list-style-type: none"> • Utiliza las herramientas disponibles con un software específico para diseño digital.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Describe los usos y aplicaciones de las paletas y menús del un software específico. • Reconoce las paletas y menús disponibles en un software específico. • Sigue el procedimiento para el uso de las paletas y menús del un software específico. • Utiliza las paletas y menús del un software específico. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
3. Reconocer los tipos de imágenes y ajustes de color que se pueden trabajar en el diseño gráfico con el apoyo de un software específico.	<ul style="list-style-type: none"> • Tipos de gráficos: <ul style="list-style-type: none"> • Mapas de bits • Gráficos vectoriales. • Resoluciones de: <ul style="list-style-type: none"> • imagen • monitor • impresora • Sistemas de entrada: <ul style="list-style-type: none"> • Scanner • Cámaras digitales • Cámaras de video • Otros. • Sistemas de salida: <ul style="list-style-type: none"> • Impresoras • Diapositivas • Otros. • Optimización de imágenes. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Identifica los tipos de gráficos e imágenes con los que se puede trabajar. • Describe las fuentes desde las que se pueden capturar las diferentes imágenes. • Ilustra el procedimiento para la captura e impresión de imágenes. • Ejemplifica el proceso para la optimización de las imágenes. 	<ul style="list-style-type: none"> • Tener una clara noción de los derechos fundamentales de cada persona. 	<ul style="list-style-type: none"> • Reconoce los tipos de imágenes y ajustes de color que se pueden trabajar en el diseño gráfico con el apoyo de un software específico.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Reconoce los tipos de gráficos e imágenes con los que se puede trabajar. • Describe las fuentes desde las que se pueden capturar las diferentes imágenes. • Captura e imprime diferentes tipos de imágenes. • Aplica el procedimiento para la optimización de las imágenes. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
	<ul style="list-style-type: none"> • Ajuste del color: <ul style="list-style-type: none"> • Fotografías • Histograma • Niveles automáticos • Contraste automático • Niveles • Curvas • Equilibrio del color • Brillo y contraste • Tono y saturación • Desaturar • Reemplazar color • Corregir selectivamente • Mezclador de canales • Invertir • Ecualizar • Umbral • Posterizar • Variaciones. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Identifica los tipos de ajustes en el color que se pueden realizar. • Describe las herramientas disponibles para ajustar el color. • Explica el procedimiento para realizar diferentes ajustes de color. • Ejemplifica el proceso para la utilización de las diferentes herramientas para el ajuste de color. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Reconoce los tipos de ajustes en el color que se pueden realizar. • Identifica las herramientas disponibles para ajustar el color. • Sigue el procedimiento para realizar diferentes ajustes de color. • Utiliza las diferentes herramientas para el ajuste de color. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
4. Utilizar las opciones de preferencias y selecciones del diseño digital por medio de un software específico.	<ul style="list-style-type: none"> • Preferencias: <ul style="list-style-type: none"> • Generales • Guardar archivo • Pantalla y cursores • Transparencia y gama • Unidades y reglas • Guías y cuadrícula. • Selecciones: <ul style="list-style-type: none"> • Trazados • Herramientas • Funciones. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Define el concepto de preferencias y selecciones. • Identifica los tipos de preferencias y selecciones con los que se puede trabajar. • Explica el procedimiento para el uso de preferencias y selecciones. • Ilustra el procedimiento para el uso de preferencias y selecciones. 	<ul style="list-style-type: none"> • Tener una clara noción de los derechos fundamentales de cada persona. 	<ul style="list-style-type: none"> • Utiliza las opciones de preferencias y selecciones del diseño digital por medio de un software específico.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Reconoce el concepto de preferencias y selecciones. • Identifica los tipos de preferencias y selecciones con los que se puede trabajar. • Sigue el procedimiento para el uso de preferencias y selecciones. • Aplica el procedimiento para el uso de preferencias y selecciones. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
5. Utilizar las herramientas y funciones para el manejo de capas, canales y máscaras de un software específico.	<ul style="list-style-type: none"> • Capas: <ul style="list-style-type: none"> • Uso • Visualización • Creación y eliminación • Duplicar y eliminar • Opciones de capa • Máscaras de capa • Mover las capas • Tipos de capas. • Canales: <ul style="list-style-type: none"> • Opciones de canal • Visualización • Trabajar en canal • Duplicación de canales • Mezcla de canales • Combinar colores. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Define el concepto de capas, canales y máscaras. • Identifica los tipos de capas, canales y máscaras con los que se puede trabajar. • Explica el procedimiento para el uso de capas, canales y máscaras. • Ilustra el procedimiento para el uso de capas, canales y máscaras. 	<ul style="list-style-type: none"> • Tener una clara noción de los derechos fundamentales de cada persona. 	<ul style="list-style-type: none"> • Utiliza las herramientas y funciones para el manejo de capas, canales y máscaras de un software específico.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
	<ul style="list-style-type: none"> • Máscaras: <ul style="list-style-type: none"> • Uso de máscaras • Máscara rápida • Aplicación de máscaras. 	<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Reconoce el concepto de capas, canales y máscaras. • Identifica los tipos de capas, canales y máscaras con los que se puede trabajar. • Sigue el procedimiento para el uso de capas, canales y máscaras. • Aplica el procedimiento para el uso de capas, canales y máscaras. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
6. Utilizar las herramientas y funciones disponibles para el manejo de texto en un software específico.	<ul style="list-style-type: none"> • Texto: <ul style="list-style-type: none"> • Aplicar textos • Edición de textos • Selección de textos • Importación de textos. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Identifica las funciones con las que se puede trabajar el texto en un software específico. • Explica el procedimiento para la edición, selección e importación de textos en un software específico. • Ilustra el procedimiento para la edición, selección e importación de textos en un software específico. 	<ul style="list-style-type: none"> • Tener una clara noción de los derechos fundamentales de cada persona. 	<ul style="list-style-type: none"> • Utiliza las herramientas y funciones disponibles para el manejo de texto en un software específico.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Identifica las funciones con las que se puede trabajar el texto en un software específico. • Sigue el procedimiento para la edición, selección e importación de textos en un software específico. • Aplica el procedimiento para la edición, selección e importación de textos en un software específico. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
7. Utilizar las herramientas disponibles para pintar y colorear con un software específico.	<ul style="list-style-type: none"> • Pintar: <ul style="list-style-type: none"> • Paleta de pinceles • Cargar pinceles • Eliminar pinceles • Crear nuevos pinceles. • Herramientas: <ul style="list-style-type: none"> • Aerógrafo • Pincel • Tampón • Borrador • Lápiz • Enfoque y desenfoque • Degradado • Otras. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Identifica las funciones de un software específico para pintar y colorear. • Describe las funciones y herramientas disponibles para crear motivos y texturas. • Explica el procedimiento para pintar, colorear, crear motivos y texturas con un software específico. • Ilustra el procedimiento para crear motivos y texturas en un software específico. 	<ul style="list-style-type: none"> • Tener una clara noción de los derechos fundamentales de cada persona. 	<ul style="list-style-type: none"> • Utiliza las herramientas disponibles para pintar y colorear con un software específico.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
	<ul style="list-style-type: none"> • Color y modos: <ul style="list-style-type: none"> • Modos de fusión • Paleta muestras de color. • Motivos y texturas: <ul style="list-style-type: none"> • Creación de motivos • Creación de texturas: <ul style="list-style-type: none"> • A partir de un documento en blanco • A partir de una imagen • Creación de fondos • Fondos a partir de una imagen • Fondos con motivos y capas. 	<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Reconoce las funciones de un software específico para pintar y colorear. • Identifica las funciones y herramientas disponibles para crear motivos y texturas. • Utiliza criterios técnicos y estéticos para la selección de colores, fondos y texturas. • Sigue el procedimiento para pintar, colorear, crear motivos y texturas con un software específico. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
8. Utilizar las funciones y herramientas disponibles en un software específico para el uso de filtros.	<ul style="list-style-type: none"> • Filtros de: <ul style="list-style-type: none"> • enfoque y desenfoque • aspecto artístico • bosquejo • texturizar • trazos de pincel • distorsión • estilización • pixelización • interpretación. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Describe los diferentes tipos de filtros, las funciones y herramientas que se pueden utilizar. • Identifica las funciones y herramientas de un software específico para el uso de filtros. • Explica el procedimiento para crear y usar filtros en un software específico. • Ilustra el procedimiento para crear y usar filtros en un software específico. 	<ul style="list-style-type: none"> • Tener una clara noción de los derechos fundamentales de cada persona. 	<ul style="list-style-type: none"> • Utiliza las funciones y herramientas disponibles en un software específico para el uso de filtros.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Identifica los diferentes tipos de filtros que se pueden utilizar. • Describe las funciones y herramientas de un software específico para el uso de filtros. • Utiliza las funciones y herramientas disponibles para crear y utilizar filtros. • Aplica el procedimiento para crear y usar filtros con un software específico. 		

PRÁCTICAS Y LISTAS DE COTEJO

DESARROLLO DE LA PRÁCTICA

UNIDAD DE ESTUDIO: Diseño Digital

PRÁCTICA No. 1

Propósito:

Escenario: Laboratorio de cómputo

Duración:

MATERIALES	MAQUINARIA	EQUIPO	HERRAMIENTA

Procedimientos

El o la docente:

- Identifica las características principales del un software específico.
- Describe los usos y aplicaciones del un software específico.
- Señala los requerimientos de hardware que tiene el un software específico.
- Examina la importancia del licenciamiento en el marco de la Ley de Propiedad Intelectual.
- Identifica las paletas y menús disponibles en el un software específico.
- Describe los usos y aplicaciones de las paletas y menús del un software específico.
- Explica el procedimiento para el uso de las paletas y menús del un software específico.
- Ilustra las aplicaciones y usos de las paletas y menús del un software específico.
- Identifica los tipos de gráficos e imágenes con los que se puede trabajar.
- Describe las fuentes desde las que se pueden capturar las diferentes imágenes.
- Ilustra el procedimiento para la captura e impresión de imágenes.
- Ejemplifica el proceso para la optimización de las imágenes.
- Identifica los tipos de ajustes en el color que se pueden realizar.
- Describe las herramientas disponibles para ajustar el color.
- Explica el procedimiento para realizar diferentes ajustes de color.
- Ejemplifica el proceso para la utilización de las diferentes herramientas para el ajuste de color.
- Define el concepto de preferencias y selecciones.
- Identifica los tipos de preferencias y selecciones con los que se puede trabajar.
- Explica el procedimiento para el uso de preferencias y selecciones.
- Ilustra el procedimiento para el uso de preferencias y selecciones.
- Define el concepto de capas, canales y máscaras.
- Identifica los tipos de capas, canales y máscaras con los que se puede trabajar.
- Explica el procedimiento para el uso de capas, canales y máscaras.
- Ilustra el procedimiento para el uso de capas, canales y máscaras.
- Identifica las funciones con las que se puede trabajar el texto en un software específico.

Procedimientos

El o la docente:

- Explica el procedimiento para la edición, selección e importación de textos en un software específico.
- Ilustra el procedimiento para la edición, selección e importación de textos en un software específico.
- Identifica las funciones de un software específico para pintar y colorear.
- Describe las funciones y herramientas disponibles para crear motivos y texturas.
- Explica el procedimiento para pintar, colorear, crear motivos y texturas con un software específico.
- Ilustra el procedimiento para crear motivos y texturas en un software específico.
- Describe los diferentes tipos de filtros, las funciones y herramientas que se pueden utilizar.
- Identifica las funciones y herramientas de un software específico para el uso de filtros.
- Explica el procedimiento para crear y usar filtros en un software específico.
- Ilustra el procedimiento para crear y usar filtros en un software específico.

LISTA DE COTEJO SUGERIDA

Fecha:

Nombre del o la estudiante:

Instrucciones:

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

DESARROLLO	SI	NO	NO APlica
Identifica correctamente las características principales de un software específico.			
Reconoce eficientemente los usos y aplicaciones del un software específico.			
Distingue los requerimientos de hardware que tiene el un software específico sin margen de error.			
Reconoce la importancia del licenciamiento en el marco de la Ley de Propiedad Intelectual sin margen de error.			
Describe correctamente los usos y aplicaciones de las paletas y menús del un software específico.			
Reconoce con precisión las paletas y menús disponibles en un software específico.			
Sigue el procedimiento para el uso de las paletas y menús del un software específico sin margen de error.			
Utiliza con eficiencia las paletas y menús del un software específico.			
Reconoce eficientemente los tipos de gráficos e imágenes con los que se puede trabajar.			
Describe las fuentes desde las que se pueden capturar las diferentes imágenes sin margen de error.			
Captura e imprime adecuadamente diferentes tipos de imágenes.			
Aplica correctamente el procedimiento para la optimización de las imágenes.			
Reconoce con eficiencia los tipos de ajustes en el color que se pueden realizar.			

DESARROLLO	SI	NO	NO APLICA
Identifica las herramientas disponibles para ajustar el color sin margen de error.			
Sigue adecuadamente el procedimiento para realizar diferentes ajustes de color.			
Utiliza las diferentes herramientas para el ajuste de color sin margen de error.			
Reconoce adecuadamente el concepto de preferencias y selecciones.			
Identifica con eficiencia los tipos de preferencias y selecciones con los que se puede trabajar.			
Sigue el procedimiento para el uso de preferencias y selecciones sin margen de error.			
Aplica el procedimiento para el uso de preferencias y selecciones sin margen de error.			
Reconoce correctamente el concepto de capas.			
Identifica los tipos de capas sin margen de error.			
Sigue correctamente el procedimiento para el uso de capas.			
Aplica adecuadamente el procedimiento para el uso de capas sin margen de error.			
Identifica correctamente las funciones con las que se puede trabajar el texto en un software específico.			
Sigue correctamente el procedimiento para la edición, selección e importación de textos en un software específico.			
Aplica el procedimiento para la edición, selección e importación de textos en un software específico sin margen de error.			
Reconoce las funciones de un software específico para pintar y colorear.			
Identifica las funciones y herramientas disponibles para crear motivos y texturas.			
Utiliza criterios técnicos y estéticos para la selección de colores, fondos y texturas.			
Sigue el procedimiento para pintar, colorear, crear motivos y texturas con un software específico sin margen de error.			
Identifica con claridad los diferentes tipos de filtros que se pueden utilizar.			

DESARROLLO	SI	NO	NO APLICA
Describe correctamente las funciones y herramientas de un software específico para el uso de filtros.			
Utiliza adecuadamente las funciones y herramientas disponibles para crear y utilizar filtros.			
Aplica el procedimiento para crear y usar filtros con un software específico sin margen de error.			

OBSERVACIONES:

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Identificar las funciones y herramientas disponibles en un software específico para la elaboración de diseños digitales.	Identifica las funciones y herramientas disponibles en un software específico para la elaboración de diseños digitales.	Identifica las características principales de un software específico.	Conocimiento	Identifica correctamente las características principales de un software específico.
		Reconoce los usos y aplicaciones del un software específico.	Desempeño	Reconoce eficientemente los usos y aplicaciones del un software específico.
		Distingue los requerimientos de hardware que tiene el un software específico.	Conocimiento	Distingue los requerimientos de hardware que tiene el un software específico sin margen de error.
		Reconoce la importancia del licenciamiento en el marco de la Ley de Propiedad Intelectual.	Desempeño	Reconoce la importancia del licenciamiento en el marco de la Ley de Propiedad Intelectual sin margen de error.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Utilizar las herramientas disponibles en un software específico para diseño digital.	Utiliza las herramientas disponibles en un software específico para diseño digital.	Describe los usos y aplicaciones de las paletas y menús del un software específico.	Conocimiento	Describe correctamente los usos y aplicaciones de las paletas y menús del un software específico.
		Reconoce las paletas y menús disponibles en un software específico.	Desempeño	Reconoce con precisión las paletas y menús disponibles en un software específico.
		Sigue el procedimiento para el uso de las paletas y menús del un software específico.	Desempeño	Sigue el procedimiento para el uso de las paletas y menús del un software específico sin margen de error.
		Utiliza las paletas y menús del un software específico.	Producto	Utiliza con eficiencia las paletas y menús del un software específico.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Reconocer los tipos de imágenes y ajustes de color que se pueden trabajar en el diseño gráfico con el apoyo de un software específico.	Reconoce los tipos de imágenes y ajustes de color que se pueden trabajar en el diseño gráfico con el apoyo de un software específico.	Reconoce los tipos de gráficos e imágenes con los que se puede trabajar.	Conocimiento	Reconoce eficientemente los tipos de gráficos e imágenes con los que se puede trabajar.
		Describe las fuentes desde las que se pueden capturar las diferentes imágenes.	Desempeño	Describe las fuentes desde las que se pueden capturar las diferentes imágenes sin margen de error.
		Captura e imprime diferentes tipos de imágenes.	Producto	Captura e imprime adecuadamente diferentes tipos de imágenes.
		Aplica el procedimiento para la optimización de las imágenes.	Producto	Aplica correctamente el procedimiento para la optimización de las imágenes.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
		Reconoce los tipos de ajustes en el color que se pueden realizar.	Conocimiento	Reconoce con eficiencia los tipos de ajustes en el color que se pueden realizar.
		Identifica las herramientas disponibles para ajustar el color.	Conocimiento	Identifica las herramientas disponibles para ajustar el color sin margen de error.
		Sigue el procedimiento para realizar diferentes ajustes de color.	Desempeño	Sigue adecuadamente el procedimiento para realizar diferentes ajustes de color.
		Utiliza las diferentes herramientas para el ajuste de color.	Producto	Utiliza las diferentes herramientas para el ajuste de color sin margen de error.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Utilizar las opciones de preferencias y selecciones del diseño digital por medio de un software específico.	Utiliza las opciones de preferencias y selecciones del diseño digital por medio de un software específico.	Reconoce el concepto de preferencias y selecciones.	Conocimiento	Reconoce adecuadamente el concepto de preferencias y selecciones.
		Identifica los tipos de preferencias y selecciones con los que se puede trabajar.	Conocimiento	Identifica con eficiencia los tipos de preferencias y selecciones con los que se puede trabajar.
		Sigue el procedimiento para el uso de preferencias y selecciones.	Desempeño	Sigue el procedimiento para el uso de preferencias y selecciones sin margen de error.
		Aplica el procedimiento para el uso de preferencias y selecciones.	Producto	Aplica el procedimiento para el uso de preferencias y selecciones sin margen de error.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Utilizar las herramientas y funciones para el manejo de capas, canales y máscaras de un software específico.	Utiliza las herramientas y funciones para el manejo de capas, canales y máscaras de un software específico.	Reconoce el concepto de capas	Conocimiento	Reconoce correctamente el concepto de capas.
		Identifica los tipos de capas	Conocimiento	Identifica los tipos de capas sin margen de error.
		Sigue el procedimiento para el uso de capas	Desempeño	Sigue correctamente el procedimiento para el uso de capas.
		Aplica el procedimiento para el uso de capas	Producto	Aplica el procedimiento para el uso de capas sin margen de error.
Utilizar las herramientas y funciones para el manejo de textos en un software específico.	Utiliza las herramientas y funciones para el manejo de textos en un software específico.	Identifica las funciones con las que se puede trabajar el texto en un software específico.	Conocimiento	Identifica correctamente las funciones con las que se puede trabajar el texto en un software específico.
		Sigue el procedimiento para la edición, selección e importación de textos en un software específico.	Desempeño	Sigue correctamente el procedimiento para la edición, selección e importación de textos en un software específico.
		Aplica el procedimiento para la edición, selección e importación de textos en un software específico.	Producto	Aplica el procedimiento para la edición, selección e importación de textos en un software específico sin margen de error.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Utilizar las herramientas disponibles para pintar y colorear con un software específico.	Utiliza las herramientas disponibles para pintar y colorear con un software específico.	<p>Reconoce las funciones de un software específico para pintar y colorear.</p> <p>Identifica las funciones y herramientas disponibles para crear motivos y texturas.</p> <p>Utiliza criterios técnicos y estéticos para la selección de colores, fondos y texturas.</p> <p>Sigue el procedimiento para pintar, colorear, crear motivos y texturas con un software específico.</p>	<p>Conocimiento</p> <p>Conocimiento</p> <p>Producto</p> <p>Desempeño</p>	<p>Reconoce correctamente las funciones de un software específico para pintar y colorear.</p> <p>Utiliza correctamente los criterios técnicos y estéticos para la selección de colores, fondos y texturas.</p> <p>Pinta y colorea diferentes imágenes en un software específico sin margen de error.</p> <p>Identifica adecuadamente las funciones y herramientas disponibles para crear motivos y texturas.</p>

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Utilizar las funciones y herramientas disponibles en un software específico para el uso de filtros.	Utiliza las funciones y herramientas disponibles en un software específico para el uso de filtros.	Identifica los diferentes tipos de filtros que se pueden utilizar.	Conocimiento	Identifica con claridad los diferentes tipos de filtros que se pueden utilizar.
		Describe las funciones y herramientas de un software específico para el uso de filtros.	Desempeño	Describe correctamente las funciones y herramientas de un software específico para el uso de filtros.
		Utiliza las funciones y herramientas disponibles para crear y utilizar filtros.	Producto	Utiliza adecuadamente las funciones y herramientas disponibles para crear y utilizar filtros.
		Aplica el procedimiento para crear y usar filtros con un software específico.	Producto	Aplica el procedimiento para crear y usar filtros con un software específico sin margen de error.

NORMA TÉCNICA DE INSTITUCIÓN EDUCATIVA

DATOS GENERALES

Titulo: Fotografía Digital
Propósito: Realizar diferentes tomas de fotografía digital.
Nivel de competencia: Básica

UNIDADES DE COMPETENCIA LABORAL QUE CONFORMAN LA NORMA

Título	Clasificación
Menciona correctamente los conceptos básicos relacionados con la toma de fotografías digitales.	Específica
Identifica eficientemente las características de la toma de fotografías digitales.	Específica
Describe adecuadamente las condiciones y principios para la toma de fotografías digitales.	Específica
Señala los elementos que intervienen en la toma de fotografías digitales sin margen de error.	Específica
Menciona eficientemente los conceptos básicos relacionados con la cámara digital.	Específica
Reconoce correctamente los tipos de cámara digital que se tienen en el mercado actual.	Específica
Utiliza eficientemente las diferentes opciones y menús disponibles en la cámara digital.	Específica
Aplica los procedimientos adecuados para la preparación, uso de la cámara digital, copiar y guardar las fotografías digitales con eficiencia.	Específica
Menciona los conceptos básicos relacionados con las normas de cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.	Específica
Reconoce las normas de cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.	Específica
Aplica los procedimientos adecuados para aplicar las normas de cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.	Específica
Aplica el procedimiento correcto para el cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.	Específica
Identifica eficientemente las características del proceso fotográfico digital.	Específica
Reconoce los procedimientos adecuados para aplicar el proceso fotográfico digital con eficiencia.	Específica
Aplica el procedimiento correcto para realizar el proceso fotográfico digital con eficiencia.	Específica
Aplica correctamente el procedimiento para la importación de las fotografías digitales.	Específica

Elementos de competencia

Referencia	Título del elemento
2.5.	Tomas de fotografía digital

Criterios de desempeño:

1. Examina los aspectos fundamentales para la toma de fotografías digitales.
2. Distingue los componentes y funcionamiento de la cámara fotográfica digital.
3. Aplica las normas de seguridad en el uso y mantenimiento de la cámara fotográfica digital.
4. Aplica los principios del proceso fotográfico digital en la toma de imágenes.

Campo de aplicación:

Categoría	Clase
Servicios	Prestación de servicios de Educación Técnica

Evidencias de desempeño:

1. Describe las condiciones y principios para la toma de fotografías digitales.
2. Señala los elementos que intervienen en la toma de fotografías digitales.
3. Utiliza las diferentes opciones y menús disponibles en la cámara digital.
4. Identifica las características del proceso fotográfico digital.

Evidencias de producto:

1. Aplica los procedimientos adecuados para la preparación, uso de la cámara digital, copiar y guardar las fotografías digitales.
2. Aplica los procedimientos adecuados para aplicar las normas de cuidado.
3. Aplica el procedimiento correcto para el cuidado, limpieza y almacenamiento de las cámaras digitales.
4. Aplica el procedimiento correcto para realizar el proceso fotográfico digital.
5. Aplica el procedimiento para la importación de las fotografías digitales.

Evidencias de conocimiento:

1. Menciona los conceptos básicos relacionados con la toma de fotografías digitales.
2. Identifica las características de la toma de fotografías digitales.
3. Menciona los conceptos básicos relacionados con la cámara digital.
4. Reconoce los tipos de cámara digital que se tienen en el mercado actual.
5. Menciona los conceptos básicos relacionados con las normas de cuidado.
6. Reconoce las normas de cuidado, limpieza y almacenamiento de las cámaras digitales.
7. Reconoce los procedimientos adecuados para aplicar el proceso fotográfico digital.

Modalidad: Comercial y de Servicios	Especialidad: Computer Science in Software Development
Sub-área: Interfaces Gráficas de Usuario	Año: Undécimo
Unidad de Estudio: Fotografía Digital	Tiempo Estimado: 24 horas
Propósito: Realizar diferentes tomas de fotografía digital.	

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
1. Examinar los aspectos fundamentales para la toma de fotografías digitales.	<ul style="list-style-type: none"> • Fotografía digital: <ul style="list-style-type: none"> • Concepto • Características • Tipos • Equipos e instrumentos necesarios • Condiciones para la toma fotográfica • Principios de calidad en la toma fotográfica. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Define los conceptos básicos relacionados con la toma de fotografías digitales. • Identifica las características de la toma de fotografías digitales. • Describe los tipos de fotografías digitales que se pueden tomar. • Ejemplifica los elementos que intervienen en la toma de fotografías digitales. 	<ul style="list-style-type: none"> • Conciencia acerca de las consecuencias que tiene todo lo que hacemos o dejamos de hacer. 	<ul style="list-style-type: none"> • Examina los aspectos fundamentales para la toma de fotografías digitales.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Menciona los conceptos básicos relacionados con la toma de fotografías digitales. • Identifica las características de la toma de fotografías digitales. • Describe las condiciones y principios para la toma de fotografías digitales. • Señala los elementos que intervienen en la toma de fotografías digitales. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
2. Distinguir los componentes y funcionamiento de la cámara fotográfica digital.	<ul style="list-style-type: none"> • Cámara digital: <ul style="list-style-type: none"> • Concepto • Características • Tipos • Componentes: <ul style="list-style-type: none"> • Lentes • Zoom • Dispositivos de almacenamiento • Fuentes de energía • Otros. • Funcionamiento • Opciones y menús disponibles. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Define los conceptos básicos relacionados con la cámara digital. • Describe los tipos de cámara digital que se tienen en el mercado actual. • Explica el uso de las diferentes opciones y menús disponibles en la cámara digital. • Ilustra el procedimiento para copiar y guardar las fotografías digitales. 	<ul style="list-style-type: none"> • Conciencia acerca de las consecuencias que tiene todo lo que hacemos o dejamos de hacer. 	<ul style="list-style-type: none"> • Distingue los componentes y funcionamiento de la cámara fotográfica digital.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Menciona los conceptos básicos relacionados con la cámara digital. • Reconoce los tipos de cámara digital que se tienen en el mercado actual. • Utiliza las diferentes opciones y menús disponibles en la cámara digital. • Aplica los procedimientos adecuados para la preparación, uso de la cámara digital, copiar y guardar las fotografías digitales. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
3. Aplicar las normas de seguridad en el uso y mantenimiento de la cámara fotográfica digital.	<ul style="list-style-type: none"> Normas de cuidado, limpieza y almacenamiento. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> Define los conceptos básicos relacionados con las normas de cuidado, limpieza y almacenamiento de las cámaras digitales. Identifica las normas de cuidado, limpieza y almacenamiento de las cámaras digitales. Describe los procedimientos adecuados para aplicar las normas de cuidado, limpieza y almacenamiento de las cámaras digitales. Demuestra el procedimiento correcto para el cuidado, limpieza y almacenamiento de las cámaras digitales. 	<ul style="list-style-type: none"> Conciencia acerca de las consecuencias que tiene todo lo que hacemos o dejamos de hacer. 	<ul style="list-style-type: none"> Aplica las normas de seguridad en el uso y mantenimiento de la cámara fotográfica digital.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Menciona los conceptos básicos relacionados con las normas de cuidado, limpieza y almacenamiento de las cámaras digitales. • Reconoce las normas de cuidado, limpieza y almacenamiento de las cámaras digitales. • Aplica los procedimientos adecuados para aplicar las normas de cuidado, limpieza y almacenamiento de las cámaras digitales. • Aplica el procedimiento correcto para el cuidado, limpieza y almacenamiento de las cámaras digitales. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
4. Aplicar los principios del proceso fotográfico digital en la toma de imágenes.	<ul style="list-style-type: none"> • Proceso fotográfico digital: <ul style="list-style-type: none"> • Concepto • Características • Etapas • Consideraciones y principios: <ul style="list-style-type: none"> • Iluminación • Brillo • Contraste • Luz • Sombra. • Efectos especiales • Toma de fotografías. • Importación de las fotografías. <ul style="list-style-type: none"> • Software • Hardware. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Define los conceptos básicos relacionados con el proceso fotográfico digital. • Describe los procedimientos adecuados para aplicar el proceso fotográfico digital. • Ilustra el proceso fotográfico en la toma de fotografías digitales. • Ejemplifica el procedimiento para la importación de las fotografías digitales. 	<ul style="list-style-type: none"> • Conciencia acerca de las consecuencias que tiene todo lo que hacemos o dejamos de hacer. 	<ul style="list-style-type: none"> • Aplica los principios del proceso fotográfico digital en la toma de imágenes.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Identifica las características del proceso fotográfico digital. • Reconoce los procedimientos adecuados para aplicar el proceso fotográfico digital. • Aplica el procedimiento correcto para realizar el proceso fotográfico digital. • Aplica el procedimiento para la importación de las fotografías digitales. 		

PRÁCTICAS Y LISTAS DE COTEJO

DESARROLLO DE LA PRÁCTICA

UNIDAD DE ESTUDIO: Fotografía Digital

PRÁCTICA No. 1

Propósito:

Escenario: Aula

Duración:

MATERIALES	MAQUINARIA	EQUIPO	HERRAMIENTA

Procedimientos

El o la docente:

- Define los conceptos básicos relacionados con la toma de fotografías digitales.
- Identifica las características de la toma de fotografías digitales.
- Describe los tipos de fotografías digitales que se pueden tomar.
- Ejemplifica los elementos que intervienen en la toma de fotografías digitales.
- Define los conceptos básicos relacionados con la cámara digital.
- Describe los tipos de cámara digital que se tienen en el mercado actual.
- Explica el uso de las diferentes opciones y menús disponibles en la cámara digital.
- Ilustra el procedimiento para copiar y guardar las fotografías digitales.
- Define los conceptos básicos relacionados con las normas de cuidado, limpieza y almacenamiento de las cámaras digitales.
- Identifica las normas de cuidado, limpieza y almacenamiento de las cámaras digitales.
- Describe los procedimientos adecuados para aplicar las normas de cuidado, limpieza y almacenamiento de las cámaras digitales.
- Demuestra el procedimiento correcto para el cuidado, limpieza y almacenamiento de las cámaras digitales.
- Define los conceptos básicos relacionados con el proceso fotográfico digital.
- Describe los procedimientos adecuados para aplicar el proceso fotográfico digital.
- Ilustra el proceso fotográfico en la toma de fotografías digitales.
- Ejemplifica el procedimiento para la importación de las fotografías digitales.

LISTA DE COTEJO SUGERIDA

Fecha:

Nombre del o la estudiante:

Instrucciones:

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

DESARROLLO	SI	NO	NO APlica
Menciona correctamente los conceptos básicos relacionados con la toma de fotografías digitales.			
Identifica eficientemente las características de la toma de fotografías digitales.			
Describe adecuadamente las condiciones y principios para la toma de fotografías digitales.			
Señala los elementos que intervienen en la toma de fotografías digitales sin margen de error.			
Menciona eficientemente los conceptos básicos relacionados con la cámara digital.			
Reconoce correctamente los tipos de cámara digital que se tienen en el mercado actual.			
Utiliza eficientemente las diferentes opciones y menús disponibles en la cámara digital.			
Aplica los procedimientos adecuados para la preparación, uso de la cámara digital, copiar y guardar las fotografías digitales con eficiencia.			
Menciona los conceptos básicos relacionados con las normas de cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.			
Reconoce las normas de cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.			
Aplica los procedimientos adecuados para aplicar las normas de cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.			
Aplica el procedimiento correcto para el cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.			

DESARROLLO	SI	NO	NO APLICA
Identifica eficientemente las características del proceso fotográfico digital.			
Reconoce los procedimientos adecuados para aplicar el proceso fotográfico digital con eficiencia.			
Aplica el procedimiento correcto para realizar el proceso fotográfico digital con eficiencia.			
Aplica correctamente el procedimiento para la importación de las fotografías digitales.			

OBSERVACIONES:

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Examinar los aspectos fundamentales para la toma de fotografías digitales.	Examina los aspectos fundamentales para la toma de fotografías digitales.	Menciona los conceptos básicos relacionados con la toma de fotografías digitales.	Conocimiento	Menciona correctamente los conceptos básicos relacionados con la toma de fotografías digitales.
		Identifica las características de la toma de fotografías digitales.	Conocimiento	Identifica eficientemente las características de la toma de fotografías digitales.
		Describe las condiciones y principios para la toma de fotografías digitales.	Desempeño	Describe adecuadamente las condiciones y principios para la toma de fotografías digitales.
		Señala los elementos que intervienen en la toma de fotografías digitales.	Desempeño	Señala los elementos que intervienen en la toma de fotografías digitales sin margen de error.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Distinguir los componentes y funcionamiento de la cámara fotográfica digital.	Distingue los componentes y funcionamiento de la cámara fotográfica digital.	Menciona los conceptos básicos relacionados con la cámara digital. Reconoce los tipos de cámara digital que se tienen en el mercado actual. Utiliza las diferentes opciones y menús disponibles en la cámara digital.	Conocimiento Conocimiento Desempeño	Menciona eficientemente los conceptos básicos relacionados con la cámara digital. Reconoce correctamente los tipos de cámara digital que se tienen en el mercado actual. Utiliza eficientemente las diferentes opciones y menús disponibles en la cámara digital.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Aplicar las normas de seguridad en el uso y mantenimiento de la cámara digital.	Aplica las normas de seguridad en el uso y mantenimiento de la cámara digital.	Menciona los conceptos básicos relacionados con las normas de cuidado.	Conocimiento	Menciona los conceptos básicos relacionados con las normas de cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.
		Reconoce las normas de cuidado, limpieza y almacenamiento de las cámaras digitales.	Conocimiento	Reconoce las normas de cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.
		Aplica los procedimientos adecuados para aplicar las normas de cuidado.	Producto	Aplica los procedimientos adecuados para aplicar las normas de cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.
		Aplica el procedimiento correcto para el cuidado, limpieza y almacenamiento de las cámaras digitales.	Producto	Aplica el procedimiento correcto para el cuidado, limpieza y almacenamiento de las cámaras digitales con eficiencia.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Aplicar los principios del proceso fotográfico digital en la toma de imágenes.	Aplica los principios del proceso fotográfico digital en la toma de imágenes.	Identifica las características del proceso fotográfico digital.	Conocimiento	Identifica eficientemente las características del proceso fotográfico digital.
		Reconoce los procedimientos adecuados para aplicar el proceso fotográfico digital.	Conocimiento	Reconoce los procedimientos adecuados para aplicar el proceso fotográfico digital con eficiencia.
		Aplica el procedimiento correcto para realizar el proceso fotográfico digital.	Producto	Aplica el procedimiento correcto para realizar el proceso fotográfico digital con eficiencia.
		Aplica el procedimiento para la importación de las fotografías digitales.	Producto	Aplica correctamente el procedimiento para la importación de las fotografías digitales.

NORMA TÉCNICA DE INSTITUCIÓN EDUCATIVA

DATOS GENERALES

Titulo:	Interfaz Gráfica de Usuario
Propósito:	Aplicación de criterios técnicos en el desarrollo de la identidad corporativa de un ente determinado y su interfaz.
Nivel de competencia:	Básica

UNIDADES DE COMPETENCIA LABORAL QUE CONFORMAN LA NORMA

Título	Clasificación
Define con precisión el concepto de identidad corporativa.	Específica
Describe correctamente la relación entre la identidad corporativa y el desempeño de la organización.	Específica
Ilustra con precisión los principios para el diseño de la identidad corporativa.	Específica
Ejemplifica los elementos que intervienen en el proceso de diseño de la identidad corporativa con eficiencia.	Específica
Menciona los conceptos asociados con el proceso de diseño de la identidad corporativa con eficiencia.	Específica
Identifica las etapas del proceso de estudio de la organización sin margen de error.	Específica
Aplica las técnicas para la realización del análisis de la organización con eficiencia.	Específica
Aplica los procedimientos para el diseño de la identidad corporativa sin margen de error.	Específica
Define con claridad los conceptos básicos relacionados con la interfaz gráfica.	Específica
Distingue el origen, las funciones y características sin margen de error.	Específica
Relaciona correctamente los diferentes criterios para el diseño de la interfaz gráfica.	Específica
Examina diferentes productos para identificar los elementos de la interfaz gráfica sin margen de error.	Específica
Identifica las consideraciones básicas para el diseño de interfaces gráficas sin margen de error.	Específica
Reconoce las normas básicas para la disposición e inserción de diferentes elementos con eficiencia.	Específica
Utiliza con precisión las técnicas para la digitalización de imágenes y sonido.	Específica
Diseña correctamente diferentes interfaces a partir de texto, sonido, imagen y animaciones.	Específica
Define con precisión conceptos básicos relacionados con el manejo de ventanas.	Específica
Identifica adecuadamente los diferentes tipos de ventanas y tipos de cohesión de las ventanas.	Específica
Describe con precisión los tipos de cohesión de ventanas por medio de ejemplos reales.	Específica

- Diseña correctamente programas sencillos que impliquen el manejo de ventanas. Específica
 Identifica adecuadamente los conceptos de interfaz interna y externa. Específica
 Reconoce con claridad la necesidad de realizar la especificación de diseño escrita. Específica
 Clasifica con precisión cada uno de los productos de la interfaz externa. Específica
 Diseña correctamente programas que utilicen los diferentes elementos de diseño de interfaces externas. Específica

Elementos de competencia

Referencia	Título del elemento
2.9.	Aplicación de criterios técnicos en el desarrollo de la identidad corporativa de un ente determinado y su interfaz.

Criterios de desempeño:

1. Identifica los conceptos y elementos básicos de la identidad corporativa.
2. Distingue las normas y técnicas básicas para la elaboración de la identidad corporativa de un ente determinado.
3. Identifica los conceptos, características y elementos que integran la interfaz gráfica de usuario.
4. Aplica las normas básicas para el diseño y construcción de interfaces gráficas de usuario.
5. Diseña diferentes tipos de ventanas de acuerdo con los criterios técnicos establecidos.
6. Desarrolla interfaces externas que cumplan con las normas técnicas definidas por el usuario.
7. Aplica destrezas, habilidades y conocimientos adquiridos referentes a las interfaces gráficas de usuarios por medio de una pasantía.

Campo de aplicación:

Categoría	Clase
Servicios	Prestación de servicios de Educación Técnica

Evidencias de desempeño:

1. Describe la relación entre la identidad corporativa y el desempeño de la organización.
2. Ilustra los principios para el diseño de la identidad corporativa.
3. Ejemplifica los elementos que intervienen en el proceso de diseño de la identidad corporativa.

4. Aplica las técnicas para la realización del análisis de la organización.
5. Aplica los procedimientos para el diseño de la identidad corporativa.
6. Distingue el origen, las funciones y características.
7. Relaciona los diferentes criterios para el diseño de la interfaz gráfica.
8. Utiliza las técnicas para la digitalización de imágenes y sonido.
9. Reconoce la necesidad de realizar la especificación de diseño escrita.

Evidencias de producto:

1. Examina diferentes productos para identificar los elementos de la interfaz gráfica.
2. Diseña diferentes interfaces a partir de texto, sonido, imagen y animaciones.
3. Diseña programas sencillos que impliquen el manejo de ventanas.
4. Diseña programas que utilicen los diferentes elementos de diseño de interfaces externas.

Evidencias de conocimiento:

1. Define el concepto de identidad corporativa
2. Menciona los conceptos asociados con el proceso de diseño de la identidad corporativa.
3. Identifica las etapas del proceso de estudio de la organización.
4. Define los conceptos básicos relacionados con la interfaz gráfica.
5. Identifica las consideraciones básicas para el diseño de interfaces gráficas.
6. Reconoce las normas básicas para la disposición e inserción de diferentes elementos.
7. Define conceptos básicos relacionados con el manejo de ventanas.
8. Identifica los diferentes tipos de ventanas y tipos de cohesión de las ventanas.
9. Describe los tipos de cohesión de ventanas por medio de ejemplos reales.
10. Identifica los conceptos de interfaz interna y externa.
11. Clasifica cada uno de los productos de la interfaz externa.

Modalidad: Comercial y de Servicios	Especialidad: Computer Science in Software Development
Sub-área: Interfaz Gráfica de Usuario	Año: Undécimo
Unidad de Estudio: Interfaz Gráfica de Usuario	Tiempo Estimado: 40 horas
Propósito: Aplicación de criterios técnicos en el desarrollo de la identidad corporativa de un ente determinado y su interfaz.	

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
1. Identificar los conceptos y elementos básicos de la identidad corporativa.	<ul style="list-style-type: none"> • Identidad corporativa: <ul style="list-style-type: none"> • Concepto. • Características. • Importancia. • Relación entre la identidad corporativa y el desempeño de la organización. • Aplicación en el desarrollo de software. • Principios para el diseño de la identidad corporativa. • Elementos que intervienen. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Define el concepto de identidad corporativa. • Describe la relación entre la identidad corporativa y el desempeño de la organización. • Ilustra los principales para el diseño de la identidad corporativa. • Ejemplifica los elementos que intervienen en el proceso de diseño de la identidad corporativa. 	<ul style="list-style-type: none"> • Esfuerzo que se realiza para conseguir algo por uno mismo o con la ayuda de los demás. 	<ul style="list-style-type: none"> • Identifica los conceptos y elementos básicos de la identidad corporativa.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA -APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Define el concepto de identidad corporativa. • Describe la relación entre la identidad corporativa y el desempeño de la organización. • Ilustra los principios para el diseño de la identidad corporativa. • Ejemplifica los elementos que intervienen en el proceso de diseño de la identidad corporativa. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA -APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
2. Distinguir las normas y técnicas básicas para la elaboración de la identidad corporativa de un ente determinado.	<ul style="list-style-type: none"> • Estudio de una organización o institución específica: <ul style="list-style-type: none"> • Concepto • Características • Tipos de empresas • Estructura orgánica y funcional • Cultura organizacional • Valores de la organización. • Diseño de la identidad corporativa: <ul style="list-style-type: none"> • Características • Componentes • Elementos organizacionales que determinan la identidad corporativa • Técnicas para el diseño de la identidad corporativa • Montaje del proyecto de diseño de la identidad corporativa. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Define los conceptos asociados con el proceso de diseño de la identidad corporativa. • Ilustra las técnicas para la realización del análisis de la organización. • Explica las etapas del proceso de diseño de la identidad corporativa. • Ejemplifica los procedimientos para el diseño de la identidad corporativa. 	<ul style="list-style-type: none"> • Esfuerzo que se realiza para conseguir algo por uno mismo o con la ayuda de los demás. 	<ul style="list-style-type: none"> • Distingue las normas y técnicas básicas para la elaboración de la identidad corporativa de un ente determinado.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA -APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<u>El o la estudiante:</u> <ul style="list-style-type: none"> • Menciona los conceptos asociados con el proceso de diseño de la identidad corporativa. • Identifica las etapas del proceso de estudio de la organización. • Aplica las técnicas para la realización del análisis de la organización. • Aplica los procedimientos para el diseño de la identidad corporativa. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
3. Identificar los conceptos, características y elementos que integran la interfaz gráfica de usuario.	<ul style="list-style-type: none"> • Interfaz gráfica de usuario: <ul style="list-style-type: none"> • Concepto • Funciones • Características • Criterios para el diseño: <ul style="list-style-type: none"> • Usuario • Sensibilidad • Personalización • Dirección • Consistencia • Claridad • Estética • Retroalimentación 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> • Define conceptos relacionados con la interfaz gráfica. • Identifica el origen, funciones y características de la interfaz gráfica. • Describe los diferentes criterios para el diseño de la interfaz gráfica. • Ilustra los diferentes criterios para el diseño. 	<ul style="list-style-type: none"> • Unión y colaboración mutua para conseguir un fin común. 	<ul style="list-style-type: none"> • Identifica los conceptos, características y elementos que integran la interfaz gráfica de usuario.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Define los conceptos básicos relacionados con la interfaz gráfica. • Distingue el origen, las funciones y características. • Relaciona los diferentes criterios para el diseño de la interfaz gráfica. • Examina diferentes productos para identificar los elementos de la interfaz gráfica. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
4. Aplicar las normas básicas para el diseño y construcción de interfaces gráficas de usuario.	<ul style="list-style-type: none"> Diseño de interfaces gráficas: <ul style="list-style-type: none"> Texto: <ul style="list-style-type: none"> Fuentes Disposición del texto. Fondos Colores Formas Imágenes Animaciones Sonidos. 	<p><u>El o la docente:</u></p> <ul style="list-style-type: none"> Nombra las consideraciones básicas relacionadas con diseño de interfaces gráficas. Ejemplifica los diferentes aspectos para el manejo de texto, fondos, colores, imágenes, animaciones y sonidos. Ilustra los criterios básicos para la inserción de diferentes elementos de diseño. Ejecuta prácticas sobre diseño de interfaces gráficas. 	<ul style="list-style-type: none"> Unión y colaboración mutua para conseguir un fin común. 	<ul style="list-style-type: none"> Aplica las normas básicas para el diseño y construcción de interfaces gráficas de usuario.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Identifica las consideraciones básicas para el diseño de interfaces gráficas. • Reconoce las normas básicas para la disposición e inserción de diferentes elementos. • Utiliza las técnicas para la digitalización de imágenes y sonido. • Diseña diferentes interfaces a partir de texto, sonido, imagen y animaciones. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
5. Diseñar diferentes tipos de ventanas de acuerdo con los criterios técnicos establecidos.	<ul style="list-style-type: none"> • Ventanas: <ul style="list-style-type: none"> • Concepto • Características • Usos y aplicaciones. • Tipos de ventanas: <ul style="list-style-type: none"> • Principal o de Aplicación • Desplegable o de aparición súbita • Hija • De respuesta • Marco MDI/hoja MDI • Carpeta con fichas o pestañas • Unidad de trabajo. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Define los conceptos básicos relacionados con el manejo de ventanas. • Identifica los diferentes tipos de ventanas y tipos de cohesión de las ventanas. • Ejemplifica los tipos de cohesión de ventanas en ejemplos reales. • Diseña programas sencillos que ilustren la Aplica de los criterios técnicos para el diseño de ventanas. 	<ul style="list-style-type: none"> • Unión y colaboración mutua para conseguir un fin común. 	<ul style="list-style-type: none"> • Diseña diferentes tipos de ventanas de acuerdo con los criterios técnicos establecidos.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
	<ul style="list-style-type: none"> • Cohesión de ventanas: <ul style="list-style-type: none"> • Tipos de cohesión: <ul style="list-style-type: none"> • Funcional • Secuencial • Comunicacional • Procedural • Temporal • Lógico • Coincidental. • Valoración de los niveles de cohesión. 	<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Define conceptos básicos relacionados con el manejo de ventanas. • Identifica los diferentes tipos de ventanas y tipos de cohesión de las ventanas. • Describe los tipos de cohesión de ventanas por medio de ejemplos reales. • Diseña programas sencillos que impliquen el manejo de ventanas. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
6. Desarrollar interfaces externas que cumplan con las normas técnicas definidas por el usuario.	<ul style="list-style-type: none"> • Interfaces: <ul style="list-style-type: none"> • Internas • Externas. • Diseño de interfaces externas: <ul style="list-style-type: none"> • Diferencias entre diseño interno y externo • Especificación de diseño escrita. • Productos del diseño de la interfaz externa: <ul style="list-style-type: none"> • Panorama del sistema • Panorama de la Aplica • Diagrama de navegación de ventanas • Disposición de ventanas • Mini especificación de la ventana • Especificación de campo. 	<u>El o la docente:</u> <ul style="list-style-type: none"> • Define los conceptos básicos relacionados con las interfaces internas y externas. • Identifica las características de cada tipo de interfaz. • Describe cada uno de los productos de la interfaz externa. • Desarrolla programas sencillos que ilustren los diferentes elementos del diseño de la interfaz externa. 	<ul style="list-style-type: none"> • Unión y colaboración mutua para conseguir un fin común. 	<ul style="list-style-type: none"> • Desarrolla interfaces externas que cumplan con las normas técnicas definidas por el usuario.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Identifica los conceptos de interfaz interna y externa. • Reconoce la necesidad de realizar la especificación de diseño escrita. • Clasifica cada uno de los productos de la interfaz externa. • Diseña programas que utilicen los diferentes elementos de diseño de interfaces externas. 		

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
7. Aplicar destrezas, habilidades y conocimientos adquiridos referentes a las interfaces gráficas de usuarios por medio de una pasantía.	<ul style="list-style-type: none"> Pasantías. 	<u>El o la docente:</u> <ul style="list-style-type: none"> Explica la importancia de las pasantías en las empresas. Señala cuál es la filosofía de las pasantías. Describe las experiencias en cada una de las tareas a realizar en la empresa. Planifica la pasantía en las empresas del entorno, coordinando con el coordinador con la empresa y director. 	<ul style="list-style-type: none"> Tener una clara noción de los derechos fundamentales de cada persona. 	<ul style="list-style-type: none"> Aplica destrezas, habilidades y conocimientos adquiridos referentes a las interfaces gráficas de usuarios por medio de una pasantía.

RESULTADOS DE APRENDIZAJE	CONTENIDOS	ESTRATEGIAS DE ENSEÑANZA - APRENDIZAJE	VALORES Y ACTITUDES	CRITERIOS DE DESEMPEÑO
		<p><u>El o la estudiante:</u></p> <ul style="list-style-type: none"> • Comenta de la importancia de las pasantías en las empresas. • Menciona la filosofía de las pasantías. • Elabora un informe de las experiencias vividas en la empresa • Organiza la pasantía en una empresa del entorno, coordinando con el coordinador con la empresa y director. 		

PRÁCTICAS Y LISTAS DE COTEJO

DESARROLLO DE LA PRÁCTICA

UNIDAD DE ESTUDIO: Interfaz Gráfica de Usuario PRÁCTICA No. 1

Propósito:

Escenario: Aula Duración:

MATERIALES	MAQUINARIA	EQUIPO	HERRAMIENTA

Procedimientos

El o la docente:

- Define el concepto de identidad corporativa.
- Describe la relación entre la identidad corporativa y el desempeño de la organización.
- Ilustra los principales para el diseño de la identidad corporativa.
- Ejemplifica los elementos que intervienen en el proceso de diseño de la identidad corporativa.
- Define los conceptos asociados con el proceso de diseño de la identidad corporativa.
- Ilustra las técnicas para la realización del análisis de la organización.
- Explica las etapas del proceso de diseño de la identidad corporativa.
- Ejemplifica los procedimientos para el diseño de la identidad corporativa.
- Define conceptos relacionados con la interfaz gráfica.
- Identifica el origen, funciones y características de la interfaz gráfica.
- Describe los diferentes criterios para el diseño de la interfaz gráfica.
- Ilustra los diferentes criterios para el diseño.
- Nombra las consideraciones básicas relacionadas con diseño de interfaces gráficas.
- Ejemplifica los diferentes aspectos para el manejo de texto, fondos, colores, imágenes, animaciones y sonidos.
- Ilustra los criterios básicos para la inserción de diferentes elementos de diseño.
- Ejecuta prácticas sobre diseño de interfaces gráficas.
- Define los conceptos básicos relacionados con el manejo de ventanas.
- Identifica los diferentes tipos de ventanas y tipos de cohesión de las ventanas.
- Ejemplifica los tipos de cohesión de ventanas en ejemplos reales.
- Diseña programas sencillos que ilustren la Aplica de los criterios técnicos para el diseño de ventanas.
- Define los conceptos básicos relacionados con las interfaces internas y externas.
- Identifica las características de cada tipo de interfaz.
- Describe cada uno de los productos de la interfaz externa.
- Desarrolla programas sencillos que ilustren los diferentes elementos del diseño de la interfaz externa.

LISTA DE COTEJO SUGERIDA

Fecha:

Nombre del o la estudiante:

Instrucciones:

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

DESARROLLO	SI	NO	NO APLICA
Define con precisión el concepto de identidad corporativa.			
Describe correctamente la relación entre la identidad corporativa y el desempeño de la organización.			
Ilustra con precisión los principios para el diseño de la identidad corporativa.			
Ejemplifica los elementos que intervienen en el proceso de diseño de la identidad corporativa con eficiencia.			
Menciona los conceptos asociados con el proceso de diseño de la identidad corporativa con eficiencia.			
Identifica las etapas del proceso de estudio de la organización sin margen de error.			
Aplica las técnicas para la realización del análisis de la organización con eficiencia.			
Aplica los procedimientos para el diseño de la identidad corporativa sin margen de error.			
Define con claridad los conceptos básicos relacionados con la interfaz gráfica.			
Distingue el origen, las funciones y características sin margen de error.			
Relaciona correctamente los diferentes criterios para el diseño de la interfaz gráfica.			
Examina diferentes productos para identificar los elementos de la interfaz gráfica sin margen de error.			
Identifica las consideraciones básicas para el diseño de interfaces gráficas sin margen de error.			

DESARROLLO	SI	NO	NO APLICA
Reconoce las normas básicas para la disposición e inserción de diferentes elementos con eficiencia.			
Utiliza con precisión las técnicas para la digitalización de imágenes y sonido.			
Diseña correctamente diferentes interfaces a partir de texto, sonido, imagen y animaciones.			
Define con precisión conceptos básicos relacionados con el manejo de ventanas.			
Identifica adecuadamente los diferentes tipos de ventanas y tipos de cohesión de las ventanas.			
Describe con precisión los tipos de cohesión de ventanas por medio de ejemplos reales.			
Diseña correctamente programas sencillos que impliquen el manejo de ventanas.			
Identifica adecuadamente los conceptos de interfaz interna y externa.			
Reconoce con claridad la necesidad de realizar la especificación de diseño escrita.			
Clasifica con precisión cada uno de los productos de la interfaz externa.			
Diseña correctamente programas que utilicen los diferentes elementos de diseño de interfaces externas.			

OBSERVACIONES:

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Identificar los conceptos y elementos básicos de la identidad corporativa.	Identifica los conceptos y elementos básicos de la identidad corporativa.	Define el concepto de identidad corporativa.	Conocimiento	Define con precisión el concepto de identidad corporativa.
		Describe la relación entre la identidad corporativa y el desempeño de la organización.	Desempeño	Describe correctamente la relación entre la identidad corporativa y el desempeño de la organización.
		Ilustra los principios para el diseño de la identidad corporativa.	Desempeño	Ilustra con precisión los principios para el diseño de la identidad corporativa.
		Ejemplifica los elementos que intervienen en el proceso de diseño de la identidad corporativa.	Desempeño	Ejemplifica los elementos que intervienen en el proceso de diseño de la identidad corporativa con eficiencia.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Distinguir las normas y técnicas básicas para la elaboración de la identidad corporativa de un ente determinado.	Distingue las normas y técnicas básicas para la elaboración de la identidad corporativa de un ente determinado.	Menciona los conceptos asociados con el proceso de diseño de la identidad corporativa.	Conocimiento	Menciona los conceptos asociados con el proceso de diseño de la identidad corporativa con eficiencia.
		Identifica las etapas del proceso de estudio de la organización.	Conocimiento	Identifica las etapas del proceso de estudio de la organización sin margen de error.
		Aplica las técnicas para la realización del análisis de la organización.	Desempeño	Aplica las técnicas para la realización del análisis de la organización con eficiencia.
		Aplica los procedimientos para el diseño de la identidad corporativa.	Desempeño	Aplica los procedimientos para el diseño de la identidad corporativa sin margen de error.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Identificar los conceptos, características y elementos que integran la interfaz gráfica de usuario.	Identifica los conceptos, características y elementos que integran la interfaz gráfica de usuario.	Define los conceptos básicos relacionados con la interfaz gráfica.	Conocimiento	Define con claridad los conceptos básicos relacionados con la interfaz gráfica.
		Distingue el origen, las funciones y características.	Desempeño	Distingue el origen, las funciones y características sin margen de error.
		Relaciona los diferentes criterios para el diseño de la interfaz gráfica.	Desempeño	Relaciona correctamente los diferentes criterios para el diseño de la interfaz gráfica.
		Examina diferentes productos para identificar los elementos de la interfaz gráfica.	Producto	Examina diferentes productos para identificar los elementos de la interfaz gráfica sin margen de error.

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Aplicar las normas básicas para el diseño y construcción de interfaces gráficas de usuario.	Aplica las normas básicas para el diseño y construcción de interfaces gráficas de usuario.	Identifica las consideraciones básicas para el diseño de interfaces gráficas.	Conocimiento	Identifica las consideraciones básicas para el diseño de interfaces gráficas sin margen de error.
		Reconoce las normas básicas para la disposición e inserción de diferentes elementos.	Conocimiento	Reconoce las normas básicas para la disposición e inserción de diferentes elementos con eficiencia.
		Utiliza las técnicas para la digitalización de imágenes y sonido.	Desempeño	Utiliza con precisión las técnicas para la digitalización de imágenes y sonido.
		Diseña diferentes interfaces a partir de texto, sonido, imagen y animaciones.	Producto	Diseña correctamente diferentes interfaces a partir de texto, sonido, imagen y animaciones.

CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Diseñar diferentes tipos de ventanas de acuerdo con los criterios técnicos establecidos.	Diseña diferentes tipos de ventanas de acuerdo con los criterios técnicos establecidos.	Define conceptos básicos relacionados con el manejo de ventanas.	Conocimiento	Define con precisión conceptos básicos relacionados con el manejo de ventanas.
		Identifica los diferentes tipos de ventanas y tipos de cohesión de las ventanas.	Conocimiento	Identifica adecuadamente los diferentes tipos de ventanas y tipos de cohesión de las ventanas.
		Describe los tipos de cohesión de ventanas por medio de ejemplos reales.	Conocimiento	Describe con precisión los tipos de cohesión de ventanas por medio de ejemplos reales.
		Diseña programas sencillos que impliquen el manejo de ventanas.	Producto	Diseña correctamente programas sencillos que impliquen el manejo de ventanas.

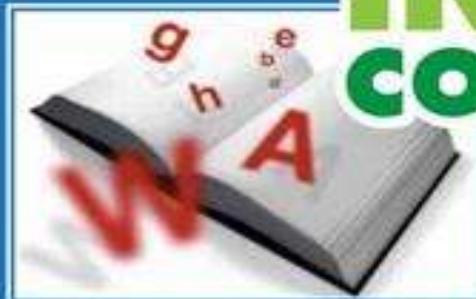
CRITERIOS PARA LA EVALUACIÓN DE LAS COMPETENCIAS

RESULTADOS DE APRENDIZAJE	CRITERIOS DE DESEMPEÑO	EVIDENCIAS	TIPO	SUFICIENCIAS DE EVIDENCIA
Desarrollar interfaces externas que cumplan con las normas técnicas definidas por el usuario.	Desarrolla interfaces externas que cumplan con las normas técnicas definidas por el usuario.	Identifica los conceptos de interfaz interna y externa.	Conocimiento	Identifica adecuadamente los conceptos de interfaz interna y externa.
		Reconoce la necesidad de realizar la especificación de diseño escrita.	Desempeño	Reconoce con claridad la necesidad de realizar la especificación de diseño escrita.
		Clasifica cada uno de los productos de la interfaz externa.	Conocimiento	Clasifica con precisión cada uno de los productos de la interfaz externa.
		Diseña programas que utilicen los diferentes elementos de diseño de interfaces externas.	Producto	Diseña correctamente programas que utilicen los diferentes elementos de diseño de interfaces externas.

Ministerio de Educación Pública
Departamento de Especialidades Técnicas



EDUCACIÓN TÉCNICA PROGRAMA DE ESTUDIO



INGLÉS PARA LA COMUNICACIÓN

DÉCIMO, UNDÉCIMO Y DUODÉCIMO
PARA LAS ESPECIALIDADES TÉCNICAS

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

“Al desarrollo por la educación”

M.Ed. Lizzette M. Vargas Murillo
Asesora Nacional de Inglés

SAN JOSÉ - COSTA RICA
SETIEMBRE, 2009

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ANNEXES

ANNEX 1

PORFOLIO 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 compiled 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:			Signature:	
Place and date:				

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 an 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.	John Peter
A grandmother who lives in ...	Age:26
A 24 Grade old nurse	Lives in London
An electrician who plays the guitar	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 odd number of students in the class, either one student 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 <i>Must be able to:</i> <i>Swim, sing</i> <i>Speak French, play the piano</i>
You can: Take shorthand type Play the piano drive Speak French and German swim	WANTED: SECRETARY <i>Must be able to</i> Type Take shorthand Speak French and German

Activity 4

Name: Job Prestige

Topic: Occupations

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

Objectives: To practice speaking about occupations.

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

Taken from Cambridge University Press.

Activity 5

Name: Secret Topic

Topic: Arguing, Expressing one's opinions

- Materials: A piece of paper with a topic on it.
- Objectives: To discuss and express one's opinions about a specific topic.
- Process: Two students agree on a topic they want to talk about without telling the others what it is. Students start discussing their topic without mentioning it. The others listen. Anyone in the rest of the group who thinks he knows what they are talking about, joins in their conversation. When about a third or half of the class have joined in the game is stopped.

Taken from Cambridge University Press.

LISSTENNING 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 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 it 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 stereotyping 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 your 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
<ul style="list-style-type: none"> • Reading • Vocabulary • Formal Speech • Journal/Diary Keeping • Creative Writing • Poetry • Verbal Debate • Impromptu Speaking • Humor/Jokes • Storytelling 	<ul style="list-style-type: none"> • Abstract Symbols/ Formulas • Outlining • Graphic Organizers • Number Sequences • Calculation • Deciphering Codes • Forcing Relationships • Syllogisms • Problem Solving • Pattern 	<ul style="list-style-type: none"> • Guided Imagery • Active Imagination • Color Schemes • Patterns/ Designs • Painting • Drawing • Mind-Mapping • Pretending • Sculpture • Pictures 	<ul style="list-style-type: none"> • Folk/Creative Dance • Role Playing • Physical Gestures • Drama • Martial Arts • Body Language • Physical Exercise • Mime • Inventing • Sports Games 	<ul style="list-style-type: none"> • Rhythmic Patterns • Vocal Sounds/Tones • Music Composition/Creation • Percussion Vibrations • Humming • Environmental Sounds • Instrumental Sounds • Singing • Tonal Patterns • Music Performance 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 subject.	Knowledge, skills, materials, learning activities and terminal behavior required in teaching of any
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.