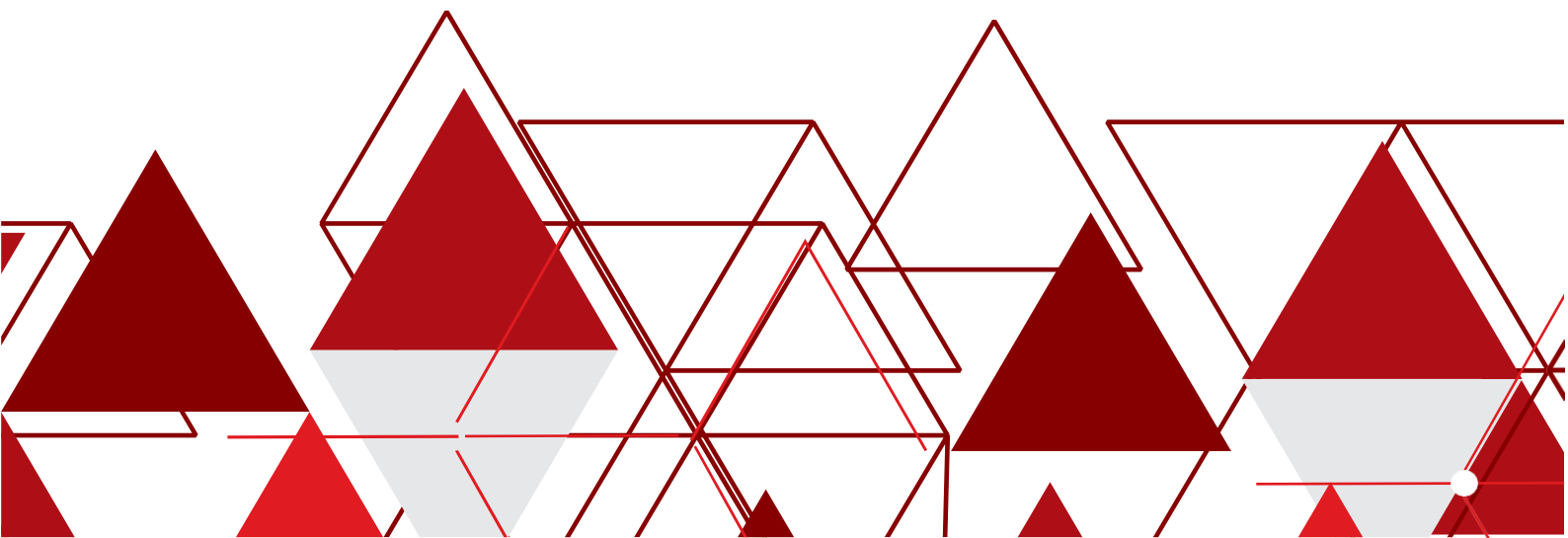


# Strategic Plan

2021-2026



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## 1. Director's Message

According to the Statutes of ISTECS - Instituto Superior de Tecnologias Avançadas (Announcement No. 6466/2009, dated August 19), the formal responsibility for preparing the Institute's strategic plan lies with the Director of ISTECS, in strong coordination with the management of the instituting body - the ITA - Instituto Tecnologias Avançadas para a Formação, Lda. This document is the result of the intersection of the perspectives of the Director of the Institute and the management of the ITA, in consultation with the ISTECS bodies: Secretary-General, Scientific Technical Council, Pedagogical Council, Internal Evaluation Committee and Student Ombudsman.

If we take into account the 31 years of ISTECS's life, an inescapable observation must be made: the fidelity to the original educational project. Although the educational offer has adapted to the technological evolution and to the national and international context, information technologies have always been the only and exclusive area of action. We must continue on this path.

We deliberately sought to develop a pragmatic plan that would avoid the easy temptation to confuse goals with wishes.

I assume that this strategic plan is the Institute's most important reference/guide, and I will do my utmost to make it a reality over the five-year timeframe.

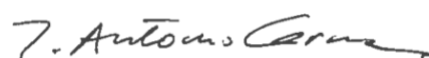
The Plan that ended, had a remarkable degree of accomplishment. I hope that in the next five-year period we will be able to achieve the main strategic axes that this new plan contemplates.

However, it should be noted that this strategic plan was developed in a scenario of great uncertainty and apprehension. The global pandemic of the so-called Covid-19, forced the reformulation of the face-to-face pedagogical model and the mobilization of platforms and methodologies of distance learning. Teachers and students have demonstrated a strong capacity for adaptation and resilience that has transcended the most optimistic perspectives.

I hope that soon everything will return to normal and we can get back to the life that our academic community has always known and enjoyed.

In spite of everything, I must state the following: ISTECS and its academic community, without exception, have shown that they can withstand adverse conditions and, therefore, the future will once again have to rely on this Institution.

Lisbon, December 31, 2020



*José António da Silva Carriço*

Director of ISTECS - Lisbon

## 2. Characterization of ISTECS and its educational offer

Given the binary nature of the Portuguese higher education system, ISTECS's training offer consists of a set of courses that fall under polytechnic higher education, focused on vocational and advanced technical training, oriented to the specific exercise of a profession.

The degrees taught at ISTECS - Computer Science and Multimedia Engineering - were both accredited by the OET - Order of Technical Engineers, in the college of computer science specialty (Announcement nº13794/2012), which expresses their polytechnic nature, and the set of engineering acts that integrate the framework of competencies, places their holders in socio-professional terms with the status of Technical Engineers.

Taking into account the syllabus, the contents of the course units, and the competency framework, the indelible trace of polytechnic higher education in the above mentioned degrees becomes obvious.

The above assertion becomes understandable when we look at the preferred professional outlets of each of the courses. Let's see:

### Master in Computer Science

#### Branch: Cloud Computing

- Cloud Developer;
- Information Systems Management (Use, Plan, Validate and Maintain IS/IT in enterprises at various levels: Private Cloud Computing, Public Cloud Computing and Hybrid Cloud Computing);
- Risk and security analysis of Information Systems;
- Design and Development of Information Systems and Decision Support at various levels: strategic, tactical and operational (on-premise and cloud);
- Digital age business management (departmental, business area and global) global level);
- Business process consulting;

- Implementation and Administration of organizations with a high degree of digitalization;
- Administration of enterprise networks based on Cloud Computing.

#### Branch: Mobile Devices and Multimedia

- Design, development and management of software and products for the web;
- Content development for mobile devices;
- Design and development of entertainment software and games;
- Consulting in the area of web product systems;
- Development of e-commerce and e-learning platforms;
- Development and implementation of content based on visual computing and multimedia;
- Management and maintenance of information systems in web technologies;
- Software design for virtual reality environments.

#### Undergraduate in Informatics:

- Development of IT solutions, including conceptual database design and application programming;
- Database systems administration;
- Design, implementation, management and maintenance of fixed and wireless local and wide area network enterprise network systems;
- Development and implementation of cryptographic techniques for the management in cybersecurity;
- Planning and implementing security systems in computer networks;
- Development and implementation of virtualization models.

### Undergraduate in Multimedia Engineering:

- Multimedia systems development;
- Production of interactive content for e-learning;
- Web application programming;
- Design and development of Web systems, namely: e-commerce and Learning Management Systems;
- Conception and development of virtual advertising, using sound, image and vídeo;
- Development of applications in 2D/3D graphic animation;
- Development of graphic interfaces for video games;
- Development of applications for mobile devices..

As regards the CTeSP's - Technical Higher Professional Courses taught at ISTECS, Networks and Computer Systems, Development of Multimedia Products, Computer Management and Development for Mobile Devices, its syllabus, content of course units, benchmarks of skills and career outlets, unequivocally demonstrate its post-secondary and polytechnic nature. These courses are markedly vocational in nature and oriented towards the exercise of specific professional activities. Let us now look at the preferred professional outlets for each of them:

### Networks and Computer Systems:

- Plan and design communication networks, according to the organization's needs and reflecting ergonomic and security concerns;
- Install and configure communication networks, in terms of cabling infrastructure, operating system, equipment and services, using the appropriate procedures to ensure their correct operation;
- Manage and maintain communication networks, systems, services and servers, in a secure, efficient and reliable way, with the aim of optimizing their operation;
- Participate in the design of a secure working environment for enterprise networks;

- Plan, install, configure, administer and support a structured database system;
- Install, configure and administer electronic mail (e-mail) platforms and web services;
- Know and analyze standards and recommendations and ensure that the organization manages its information according to good practices, ethical, legal and social principles, and international recommendations.

In short, the Higher Technician in Networks and Computer Systems is the professional who carries out, autonomously or under supervision, the installation and maintenance of networks and computer systems to support the different management areas of the organization, being able to ensure the management and operation of computer equipment and respective communication networks.

#### Mobile Device Development:

- Design application interfaces for mobile devices;
- Identify the specific needs that can be met through new applications targeted at mobile devices;
- Adapt different multimedia technologies (audio, video, and graphic animation) to the characteristics of each device;
- Integrate the application design into the development frameworks provided by each of the major mobile platforms that currently dominate the market (Android, iOS, and Windows);
- Use open Web technologies (HTML5, CSS3 and JavaScript) for development of cross-platform applications;
- Interact with the different online "stores" to publish the "apps" on the different platformsdifferent platforms;
- Develop the necessary studies and steps to implement autonomous business initiatives in the areas of application development for mobile devices;

- Identify at the level of enterprises and other organizations the areas and type of applications that can enable the maximization of efficiency levels through the use of mobile devices.

In summary, the Graduate Professional Technician in Development for Mobile Devices aims to create technicians who analyze, design and implement applications targeted at the characteristics and needs of users of various types of mobile devices (tablets, smartphones and others), as well as the various platforms currently dominant in the market (Android, iOS, Windows Phone).

### Multimedia Product Development:

- Design and development of information systems;
- Information systems planning;
- Design, implementation and administration of databases and management support systems;
- Development of applications in 2D/3D graphic animation;
- Development of computer applications to support the operation of organizations;
- Development of multimedia products;
- Exploration of software applications and multimedia tools;
- Management of organizational intervention projects and development of computer applications with the possible use of the Internet;
- Applying the tools and standard technologies for developing multimedia components;
- Design, develop, install and manage information systems and multimedia products;
- Know and analyze standards and recommendations and ensure that the organization manages its information according to good practice, ethical, legal and social principles and international recommendations.



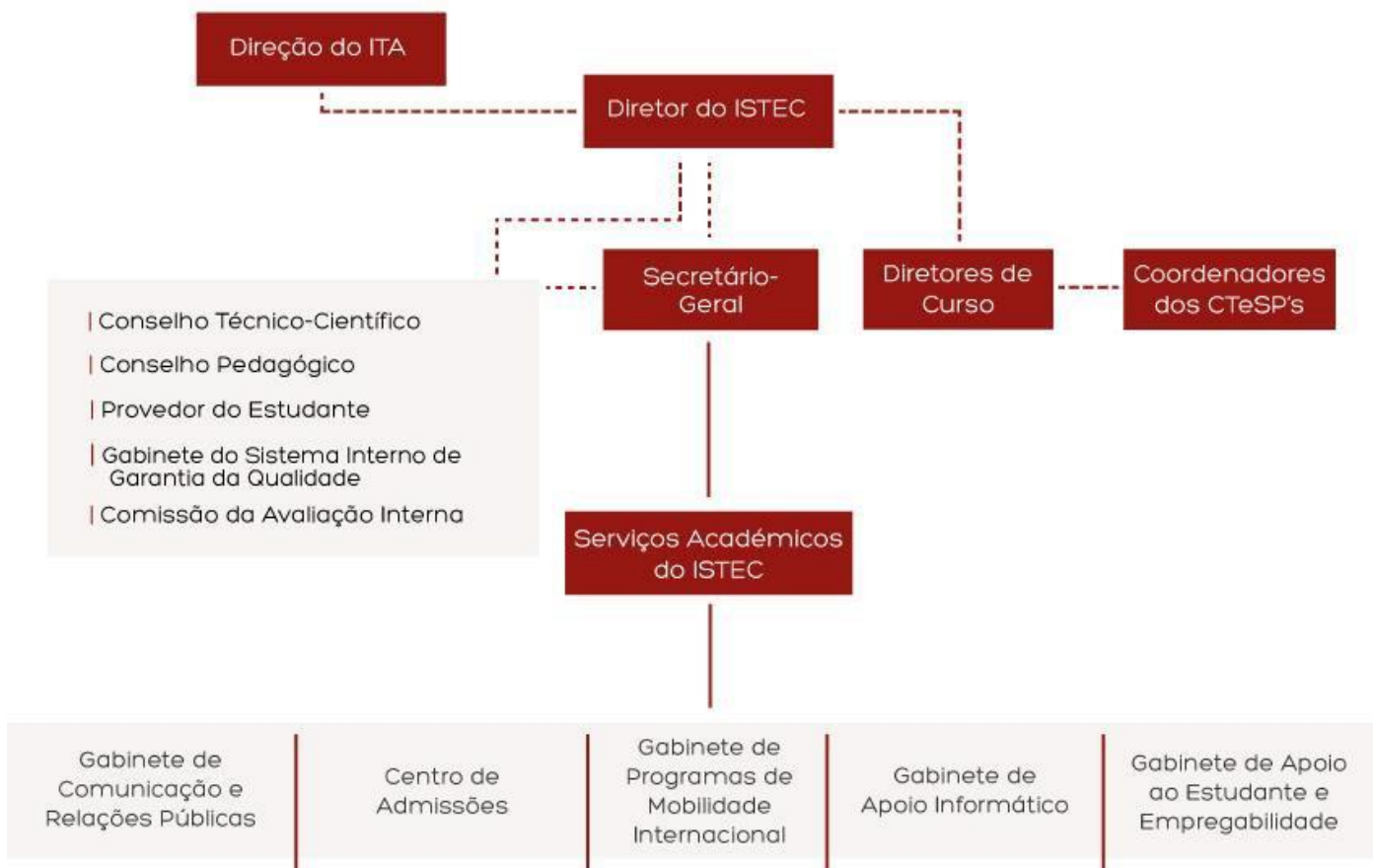
In summary, the Advanced Professional Technician in Multimedia Product Development is the professional who, autonomously or integrated into a team, conceives, plans, and develops information systems and multimedia products for the most diverse sectors of the economy, taking advantage of different computer resources.

### Computer Management:

- Contribute to the design, development, management and permanent updating of the organizations information system;
- Manage and implement IT tools to support operational, tactical and strategic management areas, as well as analyze and interpret data to support the decision making process;
- Develop applications for the functional areas of the organization, namely: human resource management, economic, financial and treasury management, stock management and procurement, marketing, etc;
- Plan, design and manage enterprise databases;
- Develop, install and maintain servers, pages and information systems in Web technologies;
- Develop, deploy, install and maintain computer applications, using object-oriented programming environments and languages;
- Participate in the design of a secure working environment for corporate networks;
- Apply the fundamental principles and techniques of project management;
- Participate in the design of a work environment that meets the legal requirements of health and safety.

In summary, the Senior Professional Technician in Management Informatics is able to manipulate, edit and analyze information, act with scientific rigor, technological and operational management capacity, tactical and strategic, in matters such as analysis, design, modeling, production, operation and maintenance of computer applications, computer networks in organizations, decision support tools and computer applications for business management. This senior professional technician, will have the ability to work adequately with the management software that major companies use, namely Primavera Software, SAP, etc.

A set of organs and services that are presented in the following diagram work in articulation with each other to achieve a fruitful and efficient implementation of the educational offer described above:



Aprovado pela Direção em 13-07-2016

### 3. Mission

ISTEC, as a higher education institution of polytechnic nature, which provides courses exclusively in the area of information technologies, has as its mission:

- a) Contribute to the valorization of the technological potential of the country's human resources;
- b) To provide a level of higher education oriented towards the practice of a profession in the areas of information technology and multimedia;
- c) To stimulate intellectual and professional training, as well as student and graduate mobility, both nationally and internationally, namely with the European area as a reference;
- d) To contribute to the provision of services to the community, mainly through the development of projects, on a partnership basis, in the area of information technologies;
- e) To implement, in departments created for the purpose, applied research practices;
- f) To promote and institutionalize measures tending to the effective professional insertion of graduates;
- g) Create, maintain and promote an effective and preferential relationship with the business and social fabric, both nationally and in its geographical area of influence;
- h) Participate in international mobility programs, preferably in the area of learning;
- i) To value and contribute to training activities for teachers, researchers and employees;
- j) To ensure the permanent updating of the syllabus and enrich the set of learning resources made available to the students, namely through the use of educational multimedia and online communication and pedagogical interaction systems, with the purpose of increasing the overall quality of the teaching provided and fostering new forms of pedagogical interaction that, by optimizing the learning times of fundamental knowledge and skills, favor and stimulate the students' initiative in order to create an education system based on the development of competencies.

#### **4. Strategic Plan (2021 - 2026)**

This plan has as its time horizon the period between January 1, 2021 and December 31, 2026.

Previously a S.W.O.T. analysis was carried out to identify ISTECS strengths, weaknesses, opportunities and threats.

Thus, it was sought to create a base scenario that would allow for the understanding, analysis and perspective of the strategic points that are effectively important and that translate into vulnerabilities or advantages.

The plan is organized as follows: it is divided into areas, within each area strategic objectives were defined, their timing for implementation and the actions leading to their operationalization.

## 4.1. S.W.O.T Analysis

From the S.W.O.T analysis the following evidence resulted:

### Strengths

- Recognition and reputation of graduates;
- High employability rate;
- Updated programs;
- Qualified teaching staff;
- Proximity with the business environment;
- Identification of students with the institution;
- Excellent relationship between professors and students;
- Organizational efficiency;
- Location of the facilities (excellent accessibility);
- Tuition fees (competitive tuition);
- Diversity of educational offer in the area of ICT's;
- Ability to adapt quickly to highly unfavorable contexts (Covid-19 crisis);
- Existence of residences for ISTECH students located within the Academic Campus;
- Accumulated know-how in distance education methodologies and strong capacity to organize and structure higher education in e-learning modalities.

### Weaknesses

- Average/Reduced international mobility of teachers and students;
  - Average/Reduced applied research;
  - Vulnerability of students and their families to negative economic cycles.
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### Opportunities

- Lifelong learning;
- Policies for increasing qualifications;
- New higher technical professional courses;
- Growth in demand for professionals in the area of ICTs (programming, networking, robotics, artificial intelligence and cybersecurity);
- Existence of target audiences different from the traditional higher education students, with specific needs that can be solved with well-structured and efficient distance learning.

### Threats

- High unemployment rates that may affect students' families;
- Unfavorable demographic developments;
- High offer of higher education in the area of ICTs.

## **4.2. Areas, Goals and Actions**

### Area - Education and Training

Objective - Diversify and increase the educational offer in the area of information technologies.

Actions:

a) From the academic year 2020/2021, create and propose for registration new higher technical professional courses in the following areas: Robotics, Cybersecurity, Computer Security and Digital Processes.

Deadline for monitoring/execution: one year.

b) From the academic year 2020/2021, create a new training offer. This new supply should be based on degrees whose pedagogical model is based exclusively on distance learning. These degrees should have as preferential target groups, the PALOP and segments of the Portuguese population whose circumstances prevent them from attending face-to-face higher education. These 1st cycle courses should be exclusively in the area of information technologies. The courses should focus on the following areas: Networks, Computer Security, Computer Science (general), Multimedia, Cybersecurity and Telecommunications.

Deadline for monitoring/execution: two year.

c) Increase the training offer in the area of extension courses, seminars and workshops in the field of information technology. In each academic year, a minimum of six extension courses, 4 seminars and 10 workshops should be held.

Deadline for monitoring/execution: annual.

d) To diversify and increase e-learning pedagogical resources made available to students on ISTE Online.

Deadline for monitoring/execution: one year.

Area - Focused/applied research and community service

Objective - Increase the levels of applied research and the number of community service projects.

Actions:

a) Stimulate the research work produced by the study and research departments, mainly in what concerns the new department of advanced computing. The publication of the journal Kriativ.Tech should be increased, with mandatory publication of articles by ISTEK faculty members with a doctoral degree or specialist title. All articles must be indexed and have peer review. Prestigious national and foreign faculty members, as well as undergraduate and master students who produce outstanding articles, should be invited to publish in the journal.

Deadline for monitoring/execution: annual.

b) Deepen the partnerships that ISTEK has already signed with institutions/companies and that have resulted in projects providing services to the community. This deepening should aim at the realization of new projects. It would be reasonable that, per academic year, two new projects would be carried out.

Deadline for monitoring/execution: annual.

c) Enter into new partnerships with institutions/companies that enable the realization of community service projects. It would be reasonable that, per school year, four new partnerships be signed, resulting in two projects.

Deadline for monitoring/execution: annual.

d) To continue to increase the number of research projects under the Erasmus program, involving national/foreign higher education institutions and national/foreign companies. It would be reasonable for these projects to increase at the rate of three per year.

Deadline for monitoring/execution: annual.

e) Create and develop a targeted research project in the area of artificial intelligence that acts as a test balloon for the knowledge and skills obtained in the bachelor's and master's degrees. This project should involve faculty and students and contain elements of high-level professional research.

Deadline for monitoring/execution: annual.

## Area - Internationalization

Objective - Increase and diversify international cooperation and mobility.

Actions:

a) Increase the number of agreements with higher education institutions in Europe that have similarities of educational offer with ISTECH. It would be reasonable that, per academic year, two agreements be made that contain the possibility of mobility of teachers and exchange of teaching experiences.

Deadline for monitoring/execution: annual.

b) Increasing the number of students participating in international learning mobility programmes. Applications to the Erasmus programme should include more students applying for work placements abroad. It would be reasonable that, per academic year, the programs would include a total of 15 internships for students who have already graduated.

Deadline for monitoring/execution: annual.

c) Increase the number of incoming and outgoing international mobility programs involving faculty and students.

Deadline for monitoring/execution: annual.



Area - Teaching and non-teaching staff

Objective - Increase the qualification of teaching and non-teaching staff.

Actions:

- a) Provide and finance, in whole or in part, doctoral programs and the possibility of competition for obtaining the title of specialist for ISTEK faculty members. It would be reasonable for this action to include two faculty members for doctoral programs, one in the area of computer science and the other in the area of multimedia. As far as obtaining the title of specialist is concerned, it would be reasonable to cover four teachers.

Deadline for monitoring/execution: three years.

- b) To make training courses available annually to ISTEK's non-teaching staff. These courses, for academic services staff, should be held in the following areas: advanced word, advanced excel, customer service and public relations and legislation on higher education. For the staff of the communication and public relations office, courses should be held in the area of digital marketing. For staff assigned to the IT support office, courses should be taken in the area of networks and computer systems, with special focus on virtualization. For each category of non-teaching staff, at least one training course per year should be held.

Deadline for monitoring/execution: annual.

## Area - Students and Graduates

Objective – To promote and monitor integral and technical training and professional insertion.

Actions:

a) To sensitize all ISTECS teachers to the importance of personal skills and citizenship and citizenship competencies.

In all curricular units, teachers should promote appropriate conduct and good practices, not allowing behaviors that show racism, xenophobia, and disrespect for the principle of equal treatment and opportunities.

This action should have a special follow-up by the Student Ombudsman.

Deadline for monitoring/execution: annual.

a) Providing a level of education that is adequate, up-to-date, and technologically responsive to the needs of the business world.

The syllabuses of all course units must be reviewed and updated annually.

Deadline for monitoring/execution: annual.

b) ISTECS, mainly through GAEE - Student and Employability Support Office, has the obligation to ensure that all graduates are inserted into working life. Under no circumstances will it be admissible that ISTECS graduates are not supported by their Institute in their professional insertion. The goal we intend to achieve is the following: for each graduate a job.

Deadline for monitoring/execution: annual.

c) Promote and maintain a positive relationship with AEISTECS - ISTECS Students Association. In order to achieve the above, the aforementioned association should be supported and funded annually in cultural, recreational, sports, artistic and scientific activities.

Under no circumstances will ISTECS's bodies admit hazing or activities of a similar nature that violate the physical integrity and dignity of its students.

Deadline for monitoring/execution: annual.

## Area - Organization and Management

Objective - To increase the overall efficiency of the management model and base it on quality.

Actions:

a) Reduce operational costs, adopting cost/benefit analysis procedures in all functional areas and departments.

Deadline for monitoring/execution: annual.

b) Diversify the funding sources.

To achieve this, community service should be increased by 40% and extension courses by 60% each academic year.

Deadline for monitoring/execution: annual.

c) To endow the Institute with material resources and equipment suitable for up-to-date, quality teaching.

At the beginning of each academic year, the ISTEAC Director, in collaboration with the Scientific Technical Council and the Course Directors, should draw up a plan for the acquisition of material/equipment.

Deadline for monitoring/execution: annual.

d) Implement the goals set forth in the 2030 Agenda for Sustainable Development, regarding economic, social and environmental sustainability.

Deadline for monitoring/execution: annual (however this process implies an extended timeframe and during the term of this strategic plan it should be monitored every year).

e) Certify by A3ES - Assessment and Accreditation Agency for Higher Education -, the Office of Internal Quality Assurance System.

Deadline for monitoring/execution: two years.

### **4.3. Monitoring and Evaluation**

The monitoring and evaluation of the strategic plan is decisive for its effective implementation.

It translates into the collection and analysis of data and information relevant to each action, with the objective of measuring its degree of execution.

At the end of each academic year, in September, a committee made up of the ISTEK Director, Secretary-General and the President of the Scientific Technical Council will prepare an annual monitoring and evaluation report on the strategic plan.