



POLITÉCNICA

# Quality Policies conformed with Accreditation Models in a Spanish Engineering School

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# Thanks!!

- **CSDU Organisers**
- **IEEE Education Society, Portuguese and Spanish Chapters,..**
- **And you**

# Outline

- **Purpose**
- **EHEA: a road for transparency and consistency**
- **Basics of Accreditation**
- **European Standards for QA**
- **Standards for QA in Engineering Education**
- **Quality Policies**
- **The Spanish Case in the context of EHEA**
- **Conclusions**

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# Purpose

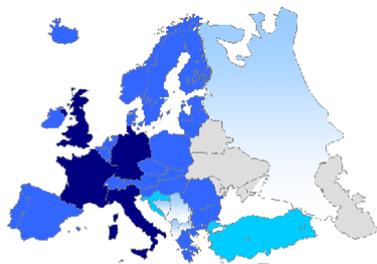
- **To understand the meaning of QA System vs accreditation and their impact and scope**
- **To review existing international approaches in the area of accreditation: European and engineering context**
- **To explain an approach to define quality policies in a Spanish Engineering school, including engineering accreditation, programs, funding programs or improvement plans**

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# European Higher Education: a road for transparency and consistency

- **The Bologna Process:**
  - Aimed at setting up throughout Europe a system of easily readable and comparable degrees
  - Biannual conferences of the National Education Ministers to verify the progress and update the objectives



- Bologna 1998
- Prague 2001
- Berlin 2003
- Bergen 2005
- London 2007

■ Sorbona (1998)  
■ Bologna (1999)  
■ Prague (2001)  
■ Berlin (2003)

# European Higher Education: a road for transparency and consistency

- **The Bologna Process and Quality:**
  - Promoting the definition of criteria and evaluation methodologies comparable
  - Critical factor of the international attractiveness
  - “European education should become a world quality reference...”
  - ENQA is in charge of the development of procedures for QA
  - Strengthened the request to develop QA systems of HE throughout the future EHEA

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# A Broad Definition of Accreditation

- **Formal recognition of an educational program by an external body on the basis of an assessment of quality**
- **An evaluation process in which an objective group (accrediting body) examines an educational program to ensure that it is meeting minimum standards established by experts in the field**
  - **The outcome of the process is binary: program is either *accredited* or *not accredited***

# The Basic Structure of the Process: Accrediting Body

- Accrediting body defines its accreditation philosophy and publishes **criteria** and **process**
- Accrediting body **identifies** and **trains** program evaluators
- Bodies that recognize accrediting bodies require proof of **decision independence**
  - The funding mechanism and accreditation decisions should be independent

# The Outcome-Based Model

- Prescribes a “small” core and basic requirements
- Prescribes basic parameters for the goals of the program
  - But does not specify the specific goals of the program
- Focuses on the goals and objectives of the program
  - E.g., to maximize the number of graduates who continue to Medical or Law school
  - E.g., to maximize the number of graduates who become program managers in the construction industry
- Requires evidence of measurement of goals
- Requires evidence of using the measurements to feed a quality improvement process

# Reflections on the Outcome-Based Model

- **Provides for significant diversity in goals and objectives**
  - Very different from the regulatory model
- **Puts a lot of responsibility and risk in the hands of the program leaders**
  - E.g., some programs may try to achieve goals that are unattainable
- **Sophisticated and hard to evaluate**
  - Very difficult to avoid complaints on inconsistent evaluations
- **This is the basic philosophy of the current ABET EC2000 and TC2000 criteria**
  - Though implementation does not always follow the philosophy

# A Word of Caution: Outcome-Based Accreditation



- While outcome-based accreditation is the most popular paradigm for accreditation, it is not problem-free
- The prescriptive nature with respect to course content can be replaced by a prescriptive process with respect to assessments
- Too much data may be collected and analyzed in order to prove that methods were assessed
- Adherence to the process by zealous program evaluators may cause strong disagreements about methodology
  - E.g., the debate about Direct Assessment

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# European Standards and Guidelines for internal QA within HEI

## ENQA Guidelines

**Policy and procedures for quality assurance:** Institutions should have a policy and associated procedures for the assurance of the quality and standards of their programmes and awards

**Approval, monitoring and periodic review of programmes and awards:** Institutions should have formal mechanisms for the approval, periodic review and monitoring of their programmes and awards

**Assessment of students:** Students should be assessed using published criteria, regulations and procedures which are consistently applied

**Quality assurance of teaching staff:** Institutions should have ways of satisfying themselves that staff involved with the teaching of students are qualified and competent to do so

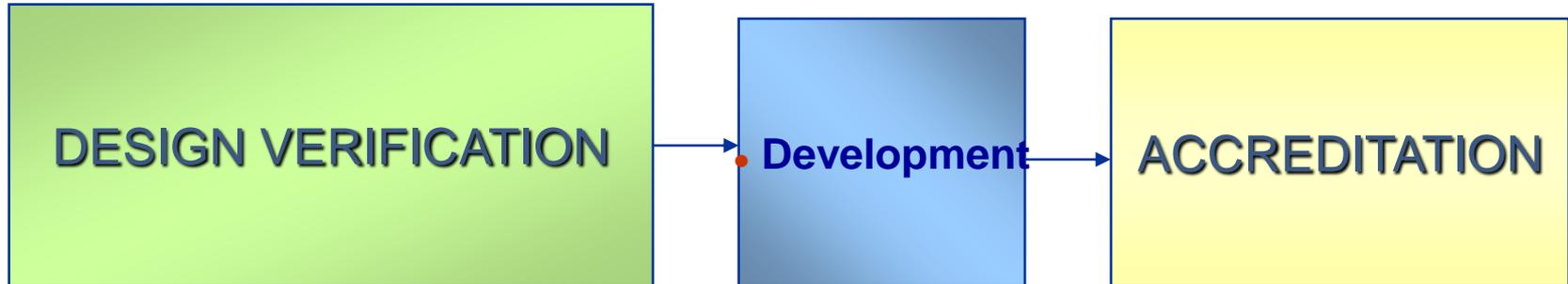
**Learning resources and student support:** Institutions should ensure that the resources available for the support of student learning are adequate and appropriate for each programme offered

**Information systems:** Institutions should ensure that they collect, analyse and use relevant information for the effective management of their programmes of study and other activities

**Public information:** Institutions should regularly publish up to date, impartial and objective information, both quantitative and qualitative, about the programmes and awards they are offering

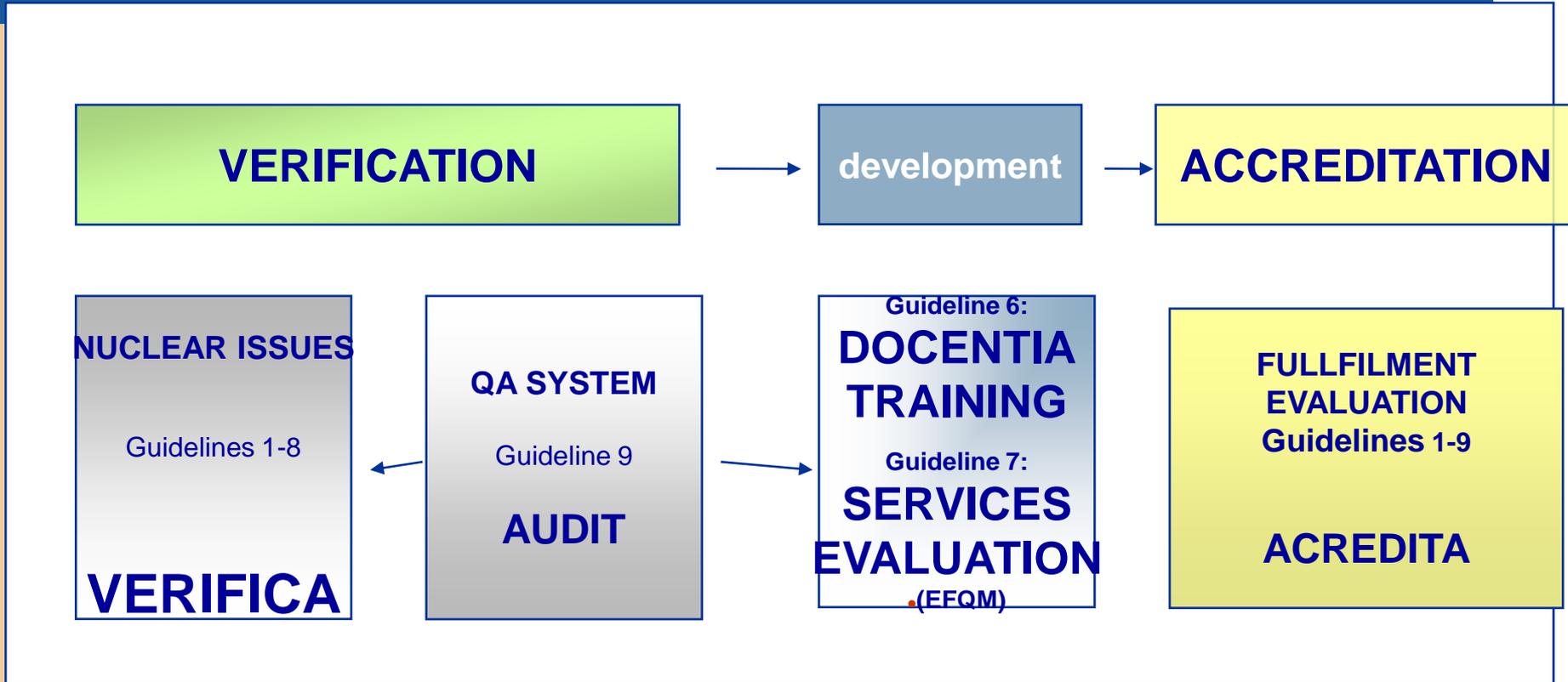
# ● Mechanisms for External QA in Spain

## ANECA



- Autonomy in the design + Evaluation and accreditation allow to:
  - a. Monitor its performance
  - b. Report to the society about the Quality
- Ex-post accreditation based on the verification of the project delivered by the university

# Evaluation Programmes. ANECA



# Elements of Programmes (proposals). ANECA

## Guidelines to elaborate a Program.

Elements that should be included:

1. Description of the Program
2. Justification
3. **Objetives**
4. Admission
5. **Planning**
6. Staff
7. Resources and Services
8. Outcomes
9. **Quality Assurance System**
10. Schedule

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# Engineering Higher Education in Europe

- **Recognition of professional qualifications:**
  - **Directives 89/48/EEC: Assure of professionals with at least 3 years the possibility of keeping their professional qualification when moving from one European Community country to the other**
  - **Transnational accreditation of education is increasingly needed in fields with international characteristics like engineering**

# Engineering Higher Education in Europe

- **“In a discipline which must change constantly to satisfy the demands of our technology-based society, the diversity of engineering degree programmes within Europe is a source of great strength. Nevertheless, as professional engineers become more mobile, society seeks greater assurance of the quality and relevance of engineering programmes : here some form of accreditation becomes a must” (EU Thematic Network E4)**

# QA Framework of Engineering Education (SIG A4, TREE)

- **Lack of an accreditation system in Engineering Education (2000)**
- **Needs emphasized**
  - The institution and its degree programmes must be able to choose the features of their Quality Management System independently (needed adaptation of this framework).
  - Quality management must not consist only of controls, but day to day operations.
  - Must provide the outside world with a basic set of uniformly organized information

# QA Framework of Engineering Education

- **Core Requisites. The programme:**
  - **Must be clearly designed around external requirements and target competencies.**
  - **Must be clearly implemented with up-to-date learning outcomes which are in agreement (content, amount, level) with the target competencies.**
  - **Must expose the students to an appropriate learning environment and equipment.**
  - **Certifies that the learning outcomes have been reached.**

# ABET

## Criteria Elements

- 1) Students
- 2) Program Educational Objectives
- 3) Program Outcomes
- 4) Assessment and Evaluation
- 5) Program Characteristics
- 6) Faculty
- 7) Facilities
- 8) Institutional and External Support
- 9) Program Criteria



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Computing, Engineering, and Technology Education*

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# ABET

## 1) Students

- Evaluation of student performance
- Advising students
- Evaluation of transfer credit
- Process for assuring that graduation requirements are met

## 2) Program Educational Objectives

- Published objectives consistent with mission
- Process for evaluating objectives

## 3) Program Outcomes

- Elements of knowledge expected of students
- Manner in which knowledge should be applied
- Process for evaluating outcomes

## 4) Assessment and Evaluation

- Use of direct and indirect measures
- Demonstrate achievement and improvement

## 9) Program Criteria

- Discipline-specific characteristics
- Associate degree requirements
- Baccalaureate degree requirements

## 5) Program Characteristics

- Integrated experience
- Applications-oriented
- Minimum credits for AS & BS
- Curricular components
- Capstone or integrating course

## 6) Faculty

- Sufficient numbers
- Appropriate education and professional experience
- Effective leadership and defined responsibilities

## 7) Facilities

- Classrooms and laboratories
- Equipment
- Information resources
- Student advisement and placement

## 8) Institutional and External Support

- Faculty selection, support, development, retention
- Student advisement and placement
- Industrial Advisory Committee
- Functioning continuous improvement plan

# EURACE. Aims.

- ensure that study programmes in engineering maintain defined educational standards;
- provide an appropriate “European label” to the graduates of the accredited educational
- programmes to complement the labels awarded by national accreditation agencies;
- facilitate trans-national recognition thanks to the common European label;
- facilitate mutual recognition agreements; and
- facilitate recognition by the competent authorities, in accord with EU Directive 2005/36/EC.

# EURACE.

## Quality Assurance

- It is also assumed that all programmes to be accredited fulfill the criteria set out in the ENQA.
- Standards are concerned with ensuring the quality of the educational process, whereas EUR-ACE.

## EURACE Framework Standards

- Regard the content define outcomes of educational programmes and standard of engineering education for professional qualification.
- It has been developed and is intended to be applied to deciding if an engineering study programme provides its graduates with the academic qualifications necessary for a career in the engineering profession

# EURACE.

- **Guidelines for a programme assessment for accreditation must at least consider:**
  - **1. Needs, Objectives and Outcomes;**
  - **2. Educational Process;**
  - **3. Resources and Partnerships;**
  - **4. Assessment of the Educational Process;**
  - **5. Management System.**

# EUROINF

- **Accreditation of an informatics degree programme is the primary result of a process used to ensure the suitability of that programme as providing the education base for the entry route to professional practice.**
- **The Standards for Accreditation can be used in both the design and the evaluation of programmes in all specialisations of informatics.**
- **Although the Framework is expressed in terms of accrediting degree programmes, it can also be used in relation to recognition of agencies that accredit (or intend to accredit) informatics programmes, in assessing the consistency of their rules and standards with the requirements of the Framework („meta-accreditation“);**
- **The Framework Standards describe the programme (learning) outcomes of an accredited higher education programme but allow for considerable variation in the emphasis of individual programmes**
- **Throughout the following statements of Standards and Procedures, the term “informatics graduate” is used to describe someone who successfully completes an accredited programme in informatics**

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# What is a Quality Policy

- **It must express the authority for the implementation of a quality management system (signed by the dean or director).**
- **It must express the intentions of the institution concerning the quality of the academic offer and the rest of services and products it supplies.**
- **It is a way to guarantee the coherence of the processes, products and services covered by the quality management system.**

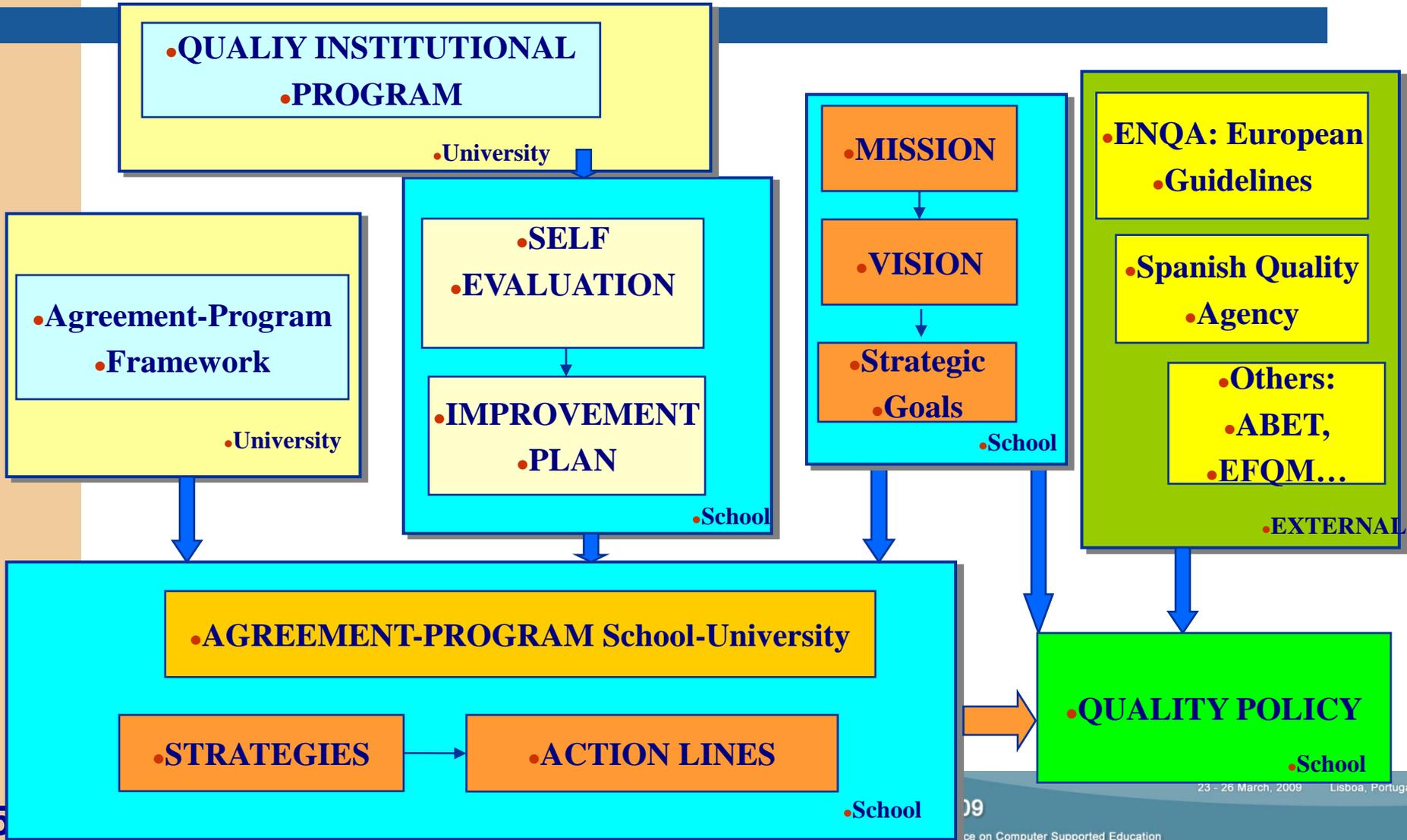
# A Process to define the Quality Policy in the EHEA

- **Phase I. Which stakeholders provide sources for the desired quality deployment of the institution?**
- **Phase II. Elicitation of policies from the sources identified**
- **Phase III. Specification of a consistent Quality Policy**

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# •SOURCES FOR THE COMPUTER ENGINEERING SCHOOL'S QUALITY POLICY (UPM)



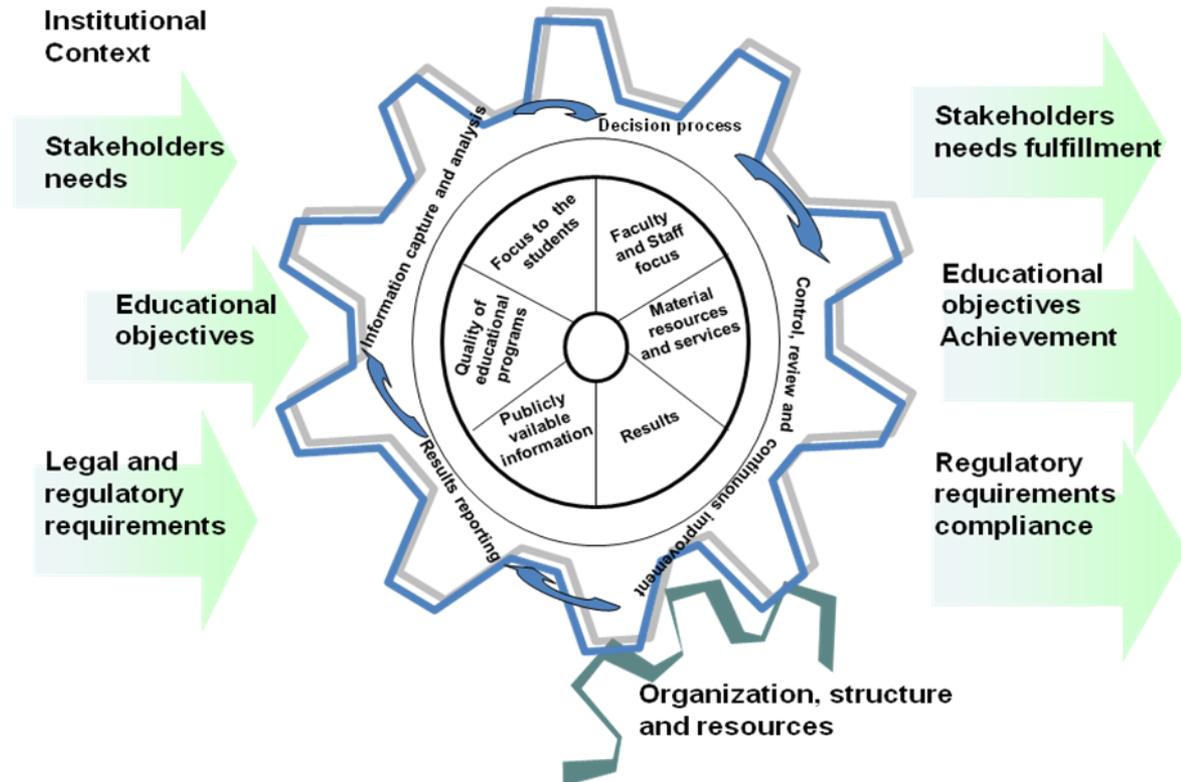
# QUALITY POLICIES SOURCES (PIC)

- To adapt the educational offer to the society and employers needs.
- To adapt the teaching methodologies to the Educational European Space (EES).
- To enhance the effectiveness and quality of the educational processes.
- To develop curricula and educational programmes with international dimension.
- To provide a continuous learning offering.
- To foster the interaction among the system R+D+I, the technology transfer and the teaching.
- To strength the application of the ICT in the educational processes.
- To promote the image of the University at national and international level, and to disseminate the contribution of the University to the society.
- To define criteria for resources distribution based upon results.
- To encourage a culture of continuous improvement.

# QUALITY POLICIES SOURCES. MISSION

- **The Mission and Vision Statements of the School of Computer Science were approved in October, 2008 ([www.fi.upm.es](http://www.fi.upm.es)):**
  - **As it says concerning to the accreditation:”... the academic offer shall be conformed to the European guidelines accreditation and others internationally recognized in the engineering sector...”**

# QUALITY POLICIES SOURCES. AUDIT PROGRAM



# QUALITY POLICIES SOURCES. PROGRAM AGREEMENT

- **Line 1: Budgetary distribution of the operating and overhead expenses**
- **Line 2: Assistance to the implementation of improvements plans**
- **Line 3: Continuous improvement processes at the Schools**

# FRAMEWORK OF PROGRAM AGREEMENT. EXAMPLE Line 2

Area	Objectives
Educational programs Planning	Increment the number of new students
	Educational profile taken into account the social and stakeholders needs
	Curriculum and educational programs review
	Implementation of mechanisms to track and - steer the development of the plan
Teaching, learning and Evaluation processes	Improve and update the contents of the courses
	Update and improve of the teaching-learning methods
Support to and communication with the students	Facilitate the integration of new students
	Design and implement tutorial plans
	Funding assistance
	Students placement and scholarships
Resources and infrastructure	Planning, evaluation and review of the library resources
	Update the classrooms and labs to the current and future needs
	Update and improve the ICT resources to the current and future needs
...	...

# THE PROBLEM ELABORATING A POLICY FROM MULTIPLE SOURCES

- **Matching of the terminology used in each source.**
- **Distinguishing the priority of the different sources.**
- **Defining quality policies with partial contributions of policies from all the sources matched by common areas.**

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# Conclusions

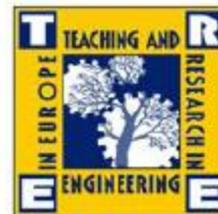
- **Which is the role of:**
  - **HEI**
  - **Accreditation**
  - **QA Systems**
  - **Policies**
  - **...**
  
- **And the teacher?**

# REFERENCES

- Accreditation of Engineering, Technology and Computing Programs, Moshe Kam, IEEE Vice President for Educational Activities, 2007.
- EUROINF
- ABET
- TREE Teaching and Research in Engineering in Europe
- ENQA
- EURACE
- ...



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