UNIVERSIDADE NOVA DE LISBOA

Self-Evaluation Report

January 2009

Annex 0.1
UNL Statutes

MINISTRY FOR SCIENCE, TECHNOLOGY AND HIGHER EDUCATION

Regulatory Order No. 42/2008

Considering that, under the terms of Article 172 (1) of Law No. 62/2007 of 10 September, higher education institutions must review their statutes so that they comply with the new legal framework for higher education institutions;

As the New University of Lisbon has approved its new Statutes under the terms of the said Article 172 and submitted them for ministerial ratification;

As they were assessed under the terms of the said law;

Under the terms of Article 69 of Law No. 62/2007 of 10 September:

I determine as follows:

1. The Statutes of the New University of Lisbon are ratified and will be published in the appendix to this order.

2. This order shall enter into force on the day after its publication in the *Diário da República.*

18 August 2008. The Minister for Science, Technology and Higher Education, *José Mariano Rebelo Pires Gago*.

Diário da República, 2nd series – No. 164 – 26 August 2008

APPENDIX

Statutes of the New University of Lisbon

CHAPTER I

Identity and mission

Article 1.

Identity

The New University of Lisbon (*UNL – Universidade Nova de Lisboa*) is identified as a university institution with internationally recognised research and quality teaching, progressively oriented towards second and third cycle education, capable of providing high levels of professional success to its students and providing relevant services to the community, national and international; a university with distinct elements at national level, both in training programmes and in pure and applied research, and with strategic partnerships of excellence.

Article 2.

Mission

The mission of UNL, as a university institution that wishes to be a reference, is broken down as follows:

a) Competitive research at international level, specialising in interdisciplinary areas, including research aimed at resolution of the problems that affect society;

b) Teaching of excellence, with a growing emphasis in the second and third cycles, but based on solid primary cycle levels, through competitive academic programmes at national and international level, praising merit as the essential measure of assessment;

c) A broader base of inter-institutional participation, geared towards integration of the various scientific cultures, with a view to creating innovative synergies for teaching and for research;

d) The provision of quality services, both nationally and internationally, capable of making a relevant contribution to social development and to qualification of human resources, giving particular attention to the countries where Portuguese is spoken.

Article 3

Evaluation

1. Apart from participation in the processes of evaluation of teaching and research, in collaboration with the competent bodies, the UNL promotes and applies instruments of self-assessment, intended to ensure the permanent quality of its activities.

2. The results of the evaluation and of the self-assessment are necessarily reflected in the allocation of resources and the adoption of quality improvement measures.

CHAPTER II

Bodies

Article 4.

Enumeration

1. The UNL is made up of the following bodies:

a) General Council;
b) Rector;
c) Board of Deans;
d) Student Council;
e) Disciplinary Council;
f) Management Council;
g) Student Ombudsperson.

2. *Ad hoc* bodies may be created at the initiative of the Rector, for defined activities and for a specific period.

Article 5.

Composition and election of the General Council

1. The General Council consists of twenty one members, made up of eleven teaching staff and researchers, three students and seven persons of recognised merit with no connection to UNL, co-opted by the elected members.

2. The lists of teaching staff and researchers who are candidates to the elections for the General Council shall obey the following requirements:

a) The first five names on each list shall belong to five distinct academic units;

b) The first three names of each list shall be full professors or coordinating researchers.

3. The professors and researchers of UNL have active electoral capacity, adopting the proportional representation electoral system.

4. The lists of students who are candidates for the elections shall comply with the following requirements:

a) The three names will belong to three distinct academic units

b) Students in the first registration in the first cycles of studies are not eligible.

5. UNL students have active electoral capacity, adopting the electoral system of proportional representation.

6. The lists of teaching staff and researchers and students shall each include three substitutes.

7. The substitutes shall be called to exercise functions in the order appearing in the list to which the terminating or precluded acting member belongs.

8. The seven persons of recognised merit without connection to UNL shall be co-opted jointly by the elected members, by absolute majority, based on grounded proposals supported by at least one third of those members;

9. The mandate of the elected or appointed members is four years, except in the case of students, in which it is two years, and they may only be removed from office by the general council itself, by absolute majority, in the event of serious fault, under the terms of the regulations of the body itself.

10. The elected members may only be re-elected once.

11. The members of the General Council can not belong to other bodies of the UNL, shall not represent groups or sectoral interests and are independent in the exercise of their functions.

12. The result of the calculation referring to the election of the students, where there is a decimal part, shall be rounded down to the closest full number.

Article 6.

Competence of the General Council

1. The General Council has competence over the following;

a) To approve its rules of procedure;

b) To approve the regulations concerning election of the Rector;

c) To elect its Chairperson, by absolute majority, from among the co-opted members;

d) To approve amendments of the statutes;

e) To propose to the Rector processes of global or sectoral assessment, concerning UNL, academic units or research centres;

f) To propose to the Rector strategies for attracting funds for the UNL;

g) To propose to the Rector appropriate measures to strengthen the relationship between the UNL and the community;

h) To audit the management of the UNL;

i) To issue statement on individuals external to the UNL indicated by the Rector to complete the boards of academic units;

j) To approve the proposal to transform the UNL into a foundation;

k) To assess the acts of the Rector and of the Management Council;

l) To propose the initiatives that it considers necessary for the effective functioning of the institution;

m) To perform the other functions provided by law.

2. The General Council has competence, on a proposal of the Rector, as follows:

a) To approve, on a proposal of the Rector, the *Charter of Principles* of the UNL;

b) To approve the medium term strategic plans and the plan of action for the four year period of the mandate of the Rector;

c) To approve the general guidelines of the institution regarding science, education, finance and property;

d) To create, transform or close down academic units;

e) To approve the annual activity plans and assess the annual report on activities of the institution;

f) To approve the budget proposal;

g) To approve the annual consolidated accounts, accompanied by the statement of the statutory auditor;

h) To establish the fees due from the students;

i) To propose or authorise, in accordance with the provisions of law, the acquisition or transfer of real property of the institution, as well as the credit operations;

j) To deliberate on the other matters that are presented to it by the Rector, particularly the constitution of partnerships involving the UNL.

3. Where the General Council does not make a decision within the period of 90 days it shall be deemed that the request is satisfied, the initiative complied with or the proposal of the Rector approved.

4. The deliberations referred to in Section 2 (b), (e) and (g) must be preceded by assessment of a statement, to be drawn up and approved by the co-opted members.

5. In cases where the statement of the co-opted members of the General Council is required, the Rector shall send the request, initiative or proposal directly, and they shall have 30 days to send it to the Chairperson of the Council.

6. The deliberations of the General Council shall be approved by simple majority, except in the cases set out in Section 1(d) and (j) and in paragraph 2(d), in which a two thirds majority is required.

7. In all matters within its competence, the General Council may seek opinions from other bodies of the institution or of its academic units.

Article 7.

Rector

The Rector is the higher body of government and external representation of the university, with responsibility for carrying out the policy of the institution and the presidency of the Management Council.

Article 8

Mandate of the Rector

1. The mandate of the Rector has a duration of four years and may be renewed once.

2. The electoral process begins three months before the end of the mandate.

3. In the event of early termination of the mandate, the new Rector will begin the new mandate.

Article 9.

Coadjuvancy and substitution of the Rector

1. The Rector may freely appoint up to four Vice-Rectors and, to assist in specific areas or determined projects, up to four Pro-Rectors; these shall terminate their functions at the end of the mandate of the Rector, who may remove them at any time.

2. In the event of temporary incapacity of the Rector, his functions shall be taken over by the Vice-Rector appointed by him or, in default, by the most senior of them.

3. Where the situation of incapacity continues for more than 90 days, the General Council must deliberate on whether there should be election of a new Rector.

4. Where the position of Rector becomes vacant or where this latter becomes incapable of exercising his functions, the Vice-Rectors shall remain in office until the beginning of the mandate of the new Rector, elected under the terms of Article 91(3) of Law No. 62/2007 of 10 September.

5. Where the Rector cannot be substituted by any of the Vice-Rectors, this shall be done by the most senior professor of the UNL.

Article 10.

Competence of the Rector

1. The Rector has the following competences:

a) To appoint persons external to the UNL who will be members of the boards of the academic units;

b) To appoint the Student Ombudsperson;

c) To appoint the Administrator of the Students Social Welfare Services;

d) To draw up and present to the General Council the following proposals:

Medium term strategic plan and action plan for the four years of the mandate;

General guidelines of the institution with regard to science and education;

Annual activity plan and report;

Budget and consolidated annual accounts, accompanied by the statement of the statutory auditor;

Acquisition or transfer of real property of the institution, and realisation of credit operations;

Creation, transformation or closing down academic units;

Fees due from students.

e) To approve the creation, suspension and termination of courses;

f) To approve the maximum values of new admissions and registrations referred to in Article 64 of the Law 62/2007 of 10th September;

g) To supervise the academic management deciding, specifically, with regard to the opening of competitions, the appointment and contracting of staff, the appointment of panels for competitions and academic juries and the system and regulations for assessing teaching staff and students;

h) To provide guidance and supervision in the administrative and financial management of the institution, ensuring efficiency in the use of its means and resources;

i) To provide support to students in the context of social welfare services, in accordance with the law;

j) To approve the concession of honorary titles or distinctions;

k) To institute academic and professional awards and incentives;

l) To ratify the statutes of the academic units, as well as the electoral results and the appointment of the members of the management bodies, which can only be denied on the basis of illegality;

m) To appoint and remove, in accordance with the law and the statutes, the Administrator of the UNL and the Deans of the services and confer office on the members of the management bodies of the academic units;

n) To re-assign teaching staff, researchers or others between academic units, under the terms of Article 126(3)(a) of Law No. 62/2007 of 10 September;

o) To ensure observance of the decisions taken by the boards of the UNL;

p) To ensure observance of the laws, statutes and regulations;

q) To propose the initiatives that are considered necessary to the proper functioning of the institution;

r) To communicate to the relevant minister all of the data necessary for the exercise of this ministry, specifically the plans and budgets and activity reports and accounts;

s) To take the measures necessary to guarantee the quality of teaching and research in the institution and in its academic units;

t) To represent the institution in court and out of it.

2. The Rector also has all of the competences that are not attributed to other bodies of the UNL by law or by these statutes.

Article 11.

Disciplinary competence of the Rector

1. The disciplinary function falls to the Rector, the exercise of which may be delegated to the respective Dean of each academic unit and in relation to disciplinary proceedings.

2. The disciplinary sanctions may only be applied by the Rector, upon considering the opinion of the Disciplinary Council.

3. The expulsion sanctions shall only be applied where this is supported in the opinion of the Disciplinary Council.

4. The opinions of the Disciplinary Council shall be dispensed with if they are not issued within the period of 30 days.

5. With the exception of the application of the sanctions referred to in Section 3, the power to sanction may only be delegated by the Rector to a Vice-Rector.

Article 12.

Regulatory competence of the Rector

1. The Rector shall have competency to approve the regulations applicable to the university as a whole, to two or more academic units or to the services of the Rector.

2. The Rector also has competence to ratify the regulations concerning the admission and career of teaching staff and researchers.

Article 13.

Delegation of competences

1. The Rector may delegate to the Deans of the academic units, in full or in part, the competences that are attributed to him in Article 92(1) (c), (d), (e) and (f) of the Law 62/2008 of 10th September.

2. The Rector may delegate to the Vice-Rectors or Pro-Rectors and also to the Administrator of the UNL, in relation to the services of the Office of the Rector, the competences that are attributed to it by Article 92(1)(e) of the Law 62/2008 of 10th September.

Article 14.

Composition of the Board of Deans

1. The Board of Deans is made up of the Deans of the academic units of the UNL and is chaired by the Rector.

2. The Board may include other members connected to the UNL, appointed for a specified period, on the initiative of the Rector and the majority of the Deans.

3. Other persons may participate in the meetings of the Board, without voting rights, where their knowledge is relevant to the matters in discussion, either on the initiative of the majority of the Deans, or of the Rector, with their agreement.

Article 15.

Competence of the Board of Deans

1. The Board of Deans has competence to deliberate on any matters that are submitted to it by the Rector.

2. The Board must be consulted in relation to the following matters:

a) Medium term strategic plan and action plan for the four years of his mandate;

b) General guidelines of the institution in relation to science and education;

c) Annual plan and activity report;

d) Budget and consolidated annual accounts, accompanied by the opinion of the statutory auditor;

e) Acquisition or transfer of real property of the institution and credit operations;

f) Creation, transformation or closing of academic units;

g) Creation, suspension and termination of courses;

h) Re-assignment of teaching staff, researchers or others between academic units;

i) Fees due from the students;

j) Assessment processes of the UNL;

k) Regulations that are within the competence of the Rector, with the exception of those that are only applicable to the services of the Office of the Rector;

l) Projects that involve various academic units;

m) Realisation of operations to finance the UNL;

n) Allocation of academic titles, honorary distinctions and prizes.

3. The obligatory opinions of the Board must be approved within the period of 30 days; once this period has expired, the Rector may take decisions without further hearings.

4. In cases of urgency, the period of consultation may be reduced by half by the Rector.

Article 16.

Student Council

1. The Student Council is the consultative body of the UNL in matters that relate directly to the life of the students.

2. The Student Council is made up of the Rector, who shall act as chairperson, by the President of the Academic Federation of the UNL, by the presidents of the student associations of the academic units of the UNL and by the Administrator of the Students Social Welfare Services of the UNL.

3. Other persons may participate in the meetings of the Student Council, without voting rights, where their knowledge is relevant to the matters in discussion, either on the initiative of the Rector or of the majority of the student representatives.

Article 17.

Competence of the Student Council

1. The Student Council shall deliberate, at the request of the Rector, on any matters that come within its sphere of competence.

2. The Student Council must be consulted in relation to the following matters:

a) Social services, namely canteens, residences, sports facilities;

b) Establishing the prices of the services provided by the Social Welfare Services;

c) Appointment of the student members of the Social Welfare Council;

d) Granting subsidies to activities promoted by the students of UNL;

e) Acts of indiscipline and other disturbances of academic life related to the so-called academic initiation;

f) Sports plan of the UNL;

g) Appointment of the Student Ombudsperson.

3. The compulsory opinions of the Student Council must be approved within the period of 30 days; once this period has expired, the Rector may take decisions without further hearings.

4. In cases of urgency, the period of consultation may be reduced by half by the Rector.

Article 18.

Disciplinary Council

1. The Disciplinary Council is the consultative body of the UNL in disciplinary matters.

2. The Disciplinary Council is made up of three teaching staff or researchers, chosen by the Rector; of one non-teaching staff, appointed by the Administrator of the UNL; and by a student, appointed by the Student Council.

3. The teaching staff members or researchers must belong to separate academic units and one of them will be a PhD in law.

4. One of the teaching staff or research members will be appointed as chairperson by the Rector.

5. The mandate of the student member has duration of two years and that of the other members has duration of four years.

Article 19.

Management Board

1. The Management Board is chaired by the Rector and made up of one to three members of the team of the Office of the Rector and by the Administrator of the UNL.

2. The Management Board has competence to do the following:

a) To carry out the management of the administration, property, finance and human resources of the UNL, and shall be subject to the legislation in force for public bodies that have administrative autonomy.

b) To establish the rates and fees.

3. The Management Board may delegate to the administrative bodies of the academic units and to the Deans of the services the competences considered necessary for more efficient management.

Article 20.

Student Ombudsperson

1. The Student Ombudsperson shall be appointed by the Rector, after consultation with the Student Council, for a period of four years, and may be re-appointed only once.

2. The Student Ombudsperson shall assess the claims brought by the students against acts or omissions of the bodies of the UNL or of its departments, and may make such recommendations to these latter as he deems fit.

Article 21

Students Social Welfare Services

1. The UNL has students social welfare services (SAS) that have administrative and financial autonomy.

2. The SAS shall have competence to ensure and provide direct and other support to the students of the UNL, under the terms established by the Law 62/2008 of 10th September.

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CHAPTER III

Academic Units

Article 22.

Numbering and Status

1. The UNL, apart from the Rectorate, is made up of the academic units set out in the appendix, all with public legal status and administrative and financial autonomy.

2. The list appearing in the appendix shall be deemed to be automatically updated as a result of the creation, closure or amendment of academic units.

Article 23.

Organisation

1. Each academic unit of the UNL shall have a representative board, made up of ten to fifteen members, in accordance with the respective statutes; this board shall be called the Faculty Council, Institute Council or School Council, depending on the name of the academic unit.

2. The composition of the board referred to in the above section shall comply with the following rules:

a) One student;
b) Six teaching staff or researchers, in the event of minimum composition;
c) Seven teaching staff or researchers, for a total number of 11 members;
d) Eight teaching staff or researchers, for a total number of 12 or 13 members;
e) Nine teaching staff or researchers, for a total number of 14 or 15 members;
f) Three to five persons external to the UNL.

3. The students and teaching staff and researchers shall be elected by the respective bodies.

4. Where elections take place on the basis of the presentation of lists, the first two names, at least, of each list competing for the elections to the body representing teaching staff and researchers shall be full professors or coordinating researchers.

5. Where there is no presentation of lists, at least two of the teaching staff or researchers elected shall be full professors or coordinating researchers.

6. Where the department has five or less full professors or coordinating researchers, the minimum number of these shall be reduced to one.

7. The mandate of elected members who are teaching staff and researchers is four years, which may be renewed only once.

8. The mandate of elected members who are students is two years, which may be renewed only once.

9. Students in the first registration in the first cycles of studies are not eligible.

10. The persons who are external to the UNL shall be appointed by the Rector, after obtaining the statement of the General Council and the competent bodies of the academic unit.

11. Apart from the election of the Dean, this body shall have the competences established for it in the statutes of each academic unit.

12. The Dean need not belong to the staff of the academic unit.

13. The statutes of the academic units may provide for the existence of other consultative bodies.

CHAPTER IV

Internal organisation

SECTION I

Rules concerning meetings and decisions

Article 24.

Meetings

1. When, at the scheduled time for the meeting, there is no quorum, it may be held an hour later, provided that one third of the acting members of the board are present.

2. The minutes of the board meetings must only set out the decisions taken, mention of the approval and the results of the voting, where these exist; votes of rejection shall only appear where the authors thereof so request.

Article 25.

Deliberations

1. The decisions of the boards shall be taken by absolute majority of the expressed votes of the members present and not precluded.

2. Where an absolute majority is not formed, the will of the body shall be ascertained by relative majority.

3. Secret voting shall only be used in elections in the cases set out in the Code of Administrative Procedure.

4. The chairperson of the body shall have the casting vote; except for the Rector when chairing the Management Board, in which he has the casting vote.

SECTION II

Administrator and services

Article 26.

Administrator

The UNL has one Administrator, with the status set out in Article 123 of Law No. 62/2007 of the RJIES.

Article 27.

Services

1. The UNL has the services necessary to ensure the pursuit of its powers and the exercise of the competences of its bodies and, moreover, to provide appropriate support to the departments.

2. The services of the UNL cover, in particular, the areas of planning, human and financial resources, international relations, information management, legal consultancy and inter-institutional development support in the areas of quality promotion, research, innovation and entrepreneurship.

3. The organisation of the services of the UNL shall be based on light and flexible structures, predominantly mission units and project teams.

4. The organisation of the services of the Office of the Rector of the UNL is determined and freely altered by the Rector and set out regulations approved by it.

CHAPTER V

Resources

Section I

Human resources

Article 28.

Principles

In relation to human resources, the UNL shall:

a) Promote observance for the principle of equality;

b) Encourage quality and innovation and the recognition of initiative and dedication;

c) Use merit, established by transparent assessment methods, as the basis for establishing remuneration and for career progression.

d) Implement individual responsibility in the performance of the established objectives.

Article 29.

Discipline

Discipline is an instrument to guarantee the conditions for the pursuit of the objectives of the UNL; the exercise of disciplinary power also has an educational function and is determined by the fundamental objective or preventing or sanctioning the damages caused to the university community by attitudes that infringe academic and professional duties; the application of disciplinary sanctions shall at all times observe the right of defence.

SECTION II

Financial and property resources

Article 30.

Assignment of resources

The UNL shall assign its financial resources to its expenses:

a) In the context of the pursuit of its mission;
b) Always observing the principle of economic rationality and efficiency, balancing the opportunity costs of options passed over and seeking to ensure that each expenditure provides the greatest benefit at all times;
c) In the performance of the applicable legal standards.

Article 31.

Property

Included in the real estate of the UNL, is the collection of property and rights assigned to the performance of its mission by the State and by any other bodies as well as the property that it acquires free of charge or for valuable consideration.

CHAPTER V

Final and transitional provisions

Article 32.

Constitution of the UNL bodies

1. The UNL bodies set out in these statutes must be constituted or endowed and in conditions to initiate its functions within the period of two months from the date of their entry into force, and the Rector shall have responsibility to carry out, or arrange to be carried out, all of the acts and initiate and conduct all of the procedures necessary for this.
2. The first election to the General Council shall be subject to the Electoral Regulations of the Statutory Assembly of the UNL, with the necessary adaptations.
3. Where the current Rector is the candidate for a new mandate, all acts relating to the respective election shall be carried out by the Vice-Rector with the greatest seniority who is not a candidate.

Article 33.

Statutes of the academic units

1. The statutes of the academic units that make up the UNL must be reviewed, so that they comply with the Law 62/2008 of 10th September and with the statutes

herein, within the period of four months, counted from the date of entry into force of these.

2. The period established in the above section may be extended by the Rector for a maximum of two months, on a proposal with grounds from the director of the academic unit.

3. The process of statutory review shall be carried out by a statutory assembly, composed of a maximum of 21 members and chaired by the chairperson, to which shall be applicable, with the necessary adaptations, the provisions of Article 172(2) and (6) of the Law 62/2008 of 10th September and Article 23(4) and (6) of these statutes.

4. The Rector shall have competence to determine the number of members of each statutory assembly, on a proposal of the Dean of the academic unit.

5. Based on a proposal of the Dean of the academic unit, the Rector may opt to transform the assembly of representatives to have statutory assembly functions.

6. The statutes shall be approved by an overall final vote by absolute majority of the number of members of the assembly and submitted to the Rector for ratification.

7. The bodies set out in the statutes of each academic unit must be constituted or endowed and in conditions to initiate its functions within the period of two months from the date of their ratification by the Rector.

Article 34.

Applicable transitional regulations

Until publication of the new regulations of the UNL, the current regulations shall remain in force, insofar as they do not contradict the law and the statutes herein, with the necessary adaptation.

Article 35

Transformation of the UNL into a foundation

1. The UNL may, at any time, decide to transform itself into a public foundation governed by private law.

2. The transformation into a foundation shall only be determined where this, apart from fulfilling the legal requirements, corresponds to the will of its bodies and academic units and where it is considered by the Rector and by the General Council to be appropriate to the development of the mission of the UNL and to the activities developed by it and is appropriate for the better management of its resources.

Article 36

Updating the UNL inventory

1. Within 30 days following the entry into force of these statutes the Rector will appoint a working group to update the inventory of the real property of the UNL and of the State property assigned to it.

2. The working group will present its report by 10 March 2009, which must set out the reasons why the property is needed for the mission and activities of the UNL.

APPENDIX

The UNL is made up of the following academic units:

a) Faculty of Sciences and Technology (*FCT – Faculdade de Ciências e Tecnologia*);

b) Faculty of Social Sciences and Humanities (*FCSH – Faculdade de Ciências Sociais e Humanas*);

c) Faculty of Economics/School of Economics and Management (*FE - Faculdade de Economia*);

d) Faculty of Medical Sciences (*FCM - Faculdade de Ciências Médicas*);

e) Faculty of Law (*FD – Faculdade de Direito*);

f) Institute of Hygiene and Tropical Medicine (*IHMT - Instituto de Higiene e Medicina Tropical*);

g) Higher Institute of Statistics and Information Management (*ISEGI – Instituto Superior de Estatística e Gestão da Informação*);

h) Institute of Chemical and Biological Technology (*ITQB – Instituto de Tecnologia Química e Biológica*);

i) National School of Public Health (*ENSP – Escola Nacional de Saúde Pública*).

UNIVERSIDADE NOVA DE LISBOA

Self-Evaluation Report

January 2009

Annex 0.2
SWOT analysis performed by the Statutory Assembly

SWOT ANALYSIS PERFORMED BY THE STATUTORY ASSEMBLY

Strengths	Weaknesses
A. ACADEMIC DIVERSITY/POTENCIAL FOR TRANSVERSAL PROJECTS UNL has a great diversity of areas with the capacity of developing joint institutional initiatives in teaching and research. There are multiple scientific areas in the several academic units, which allows for: - Innovative transversal activities. - The ability to use the resources from one academic unit in the activities of another unit. Improvement and growth potential in several areas. The diversity and autonomy of the units, which must be strengthened.	**A.GEOGRAPHICAL DISPERSION/ABSENCE OF TRANSVERSAL PROJECTS** A University that was created with a new approach (interdepartmental and with a single campus at Monte da Caparica) but that rapidly adopted an old approach (with the usual faculties, each located in separate locations throughout the cities of Lisbon and Almada): lacks a unifying vision of university. As a result of this dispersion of campuses, the image given by UNL is quite heterogeneous, both internally and externally. This multiplicity, along with the uneven dimension of the academic units, may give rise to: - A self-centered tendency - "Unfair" struggle between units with the same areas of knowledge Poor connection between departments from the same academic unit (whatever the dimension) and from different units (teaching and research) Inexistence of stable transversal programmes, due to the lack of coordination mechanisms and absence of "brand products".

Strengths	Weaknesses
B. FINANCING AND PROPERTY	**B. FINANCING AND PROPERTY** Insufficient government budget to fulfill the university's excellence goals Inexistence of a long term budget (pluriannual) that would allow for the necessary strategic planning in the promotion of scientific research, enabling the creation of internationally competitive doctoral programmes. Insufficient self-financing Inexistence of financial incentives for the entire staff (teaching and non-teaching) Although the location of UNL is settled, there are still some important unsolved patrimonial issues - debts concerning Campolide and Caparica campus. Insufficient funds for construction, expansion and maintenance of infrastructures.

Strengths	Weaknesses
C.SCIENTIFIC ACTIVITY 4 Associated Laboratories (1 full time and 3 shared), rated as "excellent". 39 research centres financed by the *Fundação para a Ciência e Tecnologia* (Science and Technology Foundation), from which 24 obtained in 2002 the "excellent" or "very good" rating. Innovative and high quality research in several scientific fields, specifically in the area of Exact and Natural Sciences, with a high level of internationalization (Leiden study). **D. INTERNATIONALIZATION** Very good national performance in the *Erasmus* programme, in terms of students Committed to the internationalization of research and teaching Committed to the cooperation with the PALOPS (Portuguese-speaking countries) **E. TEACHING AND STUDENTS** UNL ranked 2nd in terms of admissions to the 2007-08 first cycle courses. Completed the implementation of the Bologna process (main principles). Determined and active reorganization of the 3rd cycle. The quality of its "products" (courses and research) Committed to e-learning Good general quality in terms of teaching staff and students. Good employability rates of Medicine, Law, Technologies, Economy and Management graduates.	**C. SCIENTIFIC ACTIVITY** Average international production level, high in a few areas, but still below the standard levels of a European research university as UNL aims to become. **D. INTERNATIONALIZATION** Insufficient number of foreign students in a significant percentage of the courses. Low national performance in the *Erasmus* programmes, in terms of teachers. Inexistence of a structure capable of coordinating European doctoral projects, when more than one academic unit is involved. **E.TEACHING AND STUDENTS** The pass rate is still too low. Insufficient number of training courses for other university audiences. Difficulty in employing graduates from the following areas: Social Sciences and Humanities (with the exception of Economy, Management, Law, Communication Sciences, Archaeology and Geography).

Strengths	Weaknesses
F.MANAGEMENT Decentralized management with internal cohesion Central leadership, also in the academic units. The existence of a good institutional environment at UNL (strong and flexible leaderships, willing to communicate and to trust the Rector)	**F.MANAGEMENT** Inexistence of evaluation mechanisms for all UNL units, which should be based on a few principles of academic excellence. Inexistence of a coherent and global policy on recruitment and human resources management (teaching and non-teaching staff). Insufficient qualification of some technical and administrative staff (with the goal of, for example, submitting applications to European funds, etc). The risk of taking some strategic decisions that are not completely transparent (for example, the "Art School" situation that happened a year ago). The risk of information usage on management issues to be insufficiently transparent (for example, the distribution of the budget; support to some academic units or projects)

Strengths	Weaknesses
G. PRESTIGE AND RECOGNITION The university has a favourable image in terms of public opinion. Good national reputation and some international recognition in its teaching, research and services areas. Leadership in several fields (courses and research). Open to change. **H. INTERFACE WITH THE SOCIAL AND PRODUCTIVE SECTORS** Good cooperation capacity with the industry in several areas, as in the cases of Information Sciences and Biotechnology	**G.PRESTIGE AND RECOGNITION** UNL success projects have little coverage in the media. For example, research projects or services to the community with great national impact. Inexistence of patronages, as it happens in the Anglo-Saxon countries. The fund-raising could be done by the academic units, in cooperation with the Rectory. **H. INTERFACE WITH THE SOCIAL AND PRODUCTIVE SECTORS** Little communication with the business world in the majority of fields of knowledge.

Opportunities	Threats
SOCIAL/CULTURAL The society (civil society, economic agents and political structures) is open to the University. Innovating initiatives with social and cultural impact in several areas. This ability to be open to society, which is nowadays universally accepted, must be seen as an opportunity to attract investment from the civil society, by providing real projects. For example, the financing provided by the above-mentioned patronages for projects in several areas (health, engineering, etc). The ability to put out an image of a New University. A significant number of professors with important occupations in the civil society (within a limited time frame). The current external conjuncture favours change. **TECHNOLOGICAL** Access to national projects in the field of information technology.	**SOCIAL/CULTURAL** In the eyes of the public, a university is more of a provider of diplomas than an agent for development and innovation. The traditional market of the Portuguese universities is the 1st cycle. The civil society, economic agents and political structures' inability to separate the white from the yolk. One of the consequences is the lack of national awareness towards patronage. The appalling level of coverage from the media to universities, research and associated policies. A significant number of professors with important occupations in the civil society (for long periods of time). Resistance to change. **TECHNOLOGICAL** Institutional incapacity to provide support to projects in the field of information technology. Inexistence of national support to renew the equipment of major laboratories.

Opportunities	Threats
ECONOMICAL/FINANCIAL New financial management models - contractual and foundational. The ability to obtain competitive financing that will enable a more efficient use of common resources. Participation in national projects with strategic importance ((MIT/ Portugal, UT/ Portugal, CMU/ Portugal), QREN, etc). **POLITICAL** RJIES (Juridical Regime for Higher Education Institutions) Bologna Erasmus Global and European Projects Cooperation with the Portuguese-speaking countries	**ECONOMICAL/FINANCIAL** Reduction in State financing. Inexistence of PIDDAC (Regional Programme on the Investments and Expenditures for the Development of the Central Administration) in recent years. Other sources of financing are scarce and undiversified. The unclear and incoherent method of the government in supporting excellence and outlining the national strategy (as in the cases of MIT/ Portugal, UT/ Portugal, CMU/ Portugal). Difficulty in obtaining European funding. **POLITICAL** Recent changes in the national legislation with implications in the way universities are run (SIADAP, careers) which must be put in context with RJIES and the non-revision of ECDU (teaching staff careers statutes) and the financing law. The inexistence of national practices that could separate the white from the yolk and avoid the mistake of generalization. Fusion with other universities in Lisbon.

Opportunities	Threats
POSTSECONDARY/UNIVERSITIES Recruiting the best students The reorganization of doctoral courses throughout Europe will stimulate our capacity to participate in international doctoral programmes. **TERRITORIAL** Present in 3 municipalities of the Lisbon metropolitan area.	**POSTSECONDARY/UNIVERSITIES** Quality of the secondary school students. The quality of new emerging audiences. Less students, as a result of the implementation of the Bologna Process and the decrease in the number of inhabitants of the Lisbon metropolitan area. **TERRITORIAL** The existence of 3 public universities, in addition to *Universidade Aberta* and ISCTE, and several private universities in the Lisbon area. Strong competition (UL and UTL) in the same area (Lisbon), contrary to what happens in Oporto, for example.

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Annex 0.3
Composition of the self-evaluation group

ANNEX 0.3 COMPOSITION OF THE SELF-EVALUATION GROUP

Coordinator and liason person with the EUA: Professor Luís Espinha da Silveira (Pro-Rector)
Professor Rui Ganho (Vice-Rector)
Professora Maria Arménia Carrondo (Vice-Rector)
Dra. Fernanda Antão (UNL Administrator)
Doutora Patrícia Rosado Pinto (Coordinator of the Quality Office)
Dra. Maria Virgínia Guerreiro (Coordinator of the Planning Office and representative of the non-academic staff)

Representantives of the AUs:
Professora Zulema Lopes Pereira (FCT)
Professor Rui Santos (FCSH)
Professora Antonieta Cunha e Sá (FE)
Professor Miguel Xavier (FCM)
Professor António Hespanha (FD)
Professora Maria Helena Guerra (ISEGI)
Professor Cláudio Soares (ITQB)
Professor Paulo Almeida (IHMT)
Professor Julian Perelman (ENSP)

Representatives of the students:
João Magro (FE)
Diana Fernandes (FD)
Dra. Zélia Gouveia (ITQB)

Technical Support:
Doutora Ana Ramos Falcão (Research Support Office)
Dra. Daniela Costa Ramos
Maria Emília Pereira

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Annex 0.4
Map with the location of the academic units

Escola Nacional de Saúde Pública

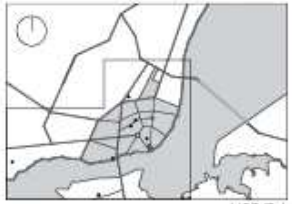
Faculdade de Ciências Sociais e Humanas

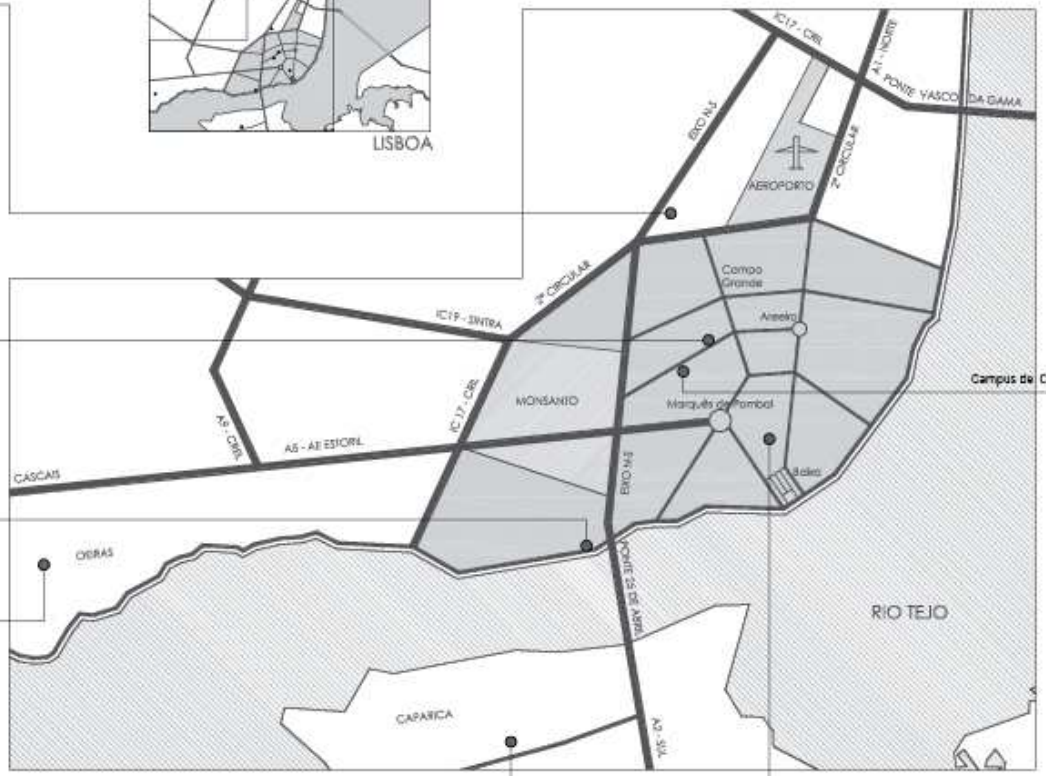
Instituto de Higiene e Medicina Tropical

Instituto de Tecnologia Química e Biológica

Campus da Caparica

Faculdade de Ciências e Tecnologia





Reitoria / Serviços de Acção Social

Faculdade de Direito

Campus de Campolide

Faculdade de Economia

I. S. de Estatística e Gestão de Informação

Faculdade de Ciências Médicas

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Annex 0.5
Overall characterization of the infrastructures

INFRASTRUCTURES - NOVA

2007/08

	FCT	FCSH	FE	FCM	FD	IHMT	ISEGI	ITQB	ENSP	R and SAS
Number of Buildings	16	5	2	6	1	5	1	1	1	1
Location	Campus do Monte da Caparica, Almada	Av. de Berna, Lisboa	Campus de Campolide, Lisboa	Cpº. Mártires da Pátria, Lisboa	Campus de Campolide, Lisboa	Rua da Junqueira, Lisboa	Campus de Campolide, Lisboa	Quinta do Marquês, Oeiras	Av. Padre Cruz, Lisboa	Campus de Campolide, Lisboa
Utilization	Teaching, Research, Services	Teaching, Research, Services	Teaching, Research, Services	Teaching, Research, Services	Teaching, Research, Services	Teaching, Research, Services	Teaching, Research, Services	Teaching, Research, Services	Teaching, Research, Services	Administrative Services
Age (years)	29 ... 2	22 ... 5	20 ... 9	38 ... 6	7	50 ... 15	15	12	31	6
Condition	Satisfactory but requires heavy maintenance /restoration	Unsatisfactory but requires heavy maintenance /restoration	Satisfactory but requires maintenance /restoration	Remodeling, expansion (**)	Remodeling, expansion (*)	Requires maintenance Remodeling, expansion	Remodeling, expansion (*)	Satisfactory but requires maintenance	Satisfactory but requires maintenance	Satisfactory but requires maintenance
Land Area (m2)	**616 047**	**12 000**	**50 300**	**9 165**	**50 300**	**30 125**	**50 300**	**19 196**		**50 300**
Gross Area (m2)	**79 094**	**19 087**	**17 856**	**13 411**	**3 031**	**12 460**	**2 446**	**16 451**	**4 715**	**7 712**
Assignable Area (m2)	**45 380**	**10 611**	**7 999**	**6 984**	**1 718**	**6 864**	**1 555**	**9 157**	**1 896**	**5 439**
Administrative office	5 915	1 700	1 575	1 492	252	1 030	259	1 030	405	4 898
Teaching area: Classrooms, anfitheatres	6 227	3 243	2 490	1 287	637	360	680	382	393	541 ***
Teaching Laboratories	13 328	600		1 025	82	1 130		2 915	39	
Teaching staff offices and meeting rooms	7 927	2 042	1 376	1 177	241	1 012	188	658	628	
Research Laboratories	3 120	1 003		690	57	2 295	62	3 567	39	
Libraries	4 700	1 003	846	464	320	386	165	234	160	
Studyrooms and Computer spaces	1 363	420	1 033	279	108	371	169	90	137	
Students spaces (union, restaurant, bar, lounge...)	2 800	600	678	570	22	280	32	281	95	
Students (2007/08)	5 723	4 054	1 925	1 306	583	88	400	212	137	
Staff (2007/08)	652,6	312,8	148,4	310,9	42,6	99,3	38,6	123,7	53,7	154,0

(*) Waiting availability of funds for replacement

(**) Funded

(***) Non-teaching area: Auditorium

Source: ICI/MCTES

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Annex 0.6
NOVA in NUMBERS

FREQUENTLY USED ABBREVIATIONS AND GLOSSARY

NOVA	New university of Lisbon	Universidade Nova de Lisboa
AU	Academic Units (Faculties, Institutes, School and Rectorate) as mentioned below:	Unidades Orgânicas:
FCT	Faculty of Sciences and Technology	Faculdade de Ciências e Tecnologia
FCSH	Faculty of Social Sciences and Humanities	Faculdade de Ciências Sociais e Humanas
FE	Faculty of Economics (School of Economics and Management)	Faculdade de Economia
FCM	Faculty of Medical Sciences	Faculdade de Ciências Médicas
FD	Faculty of Law	Faculdade de Direito
IHMT	Institute of Hygiene and Tropical Medicine	Instituto de Higiene e Medicina Tropical
ISEGI	Institute of Statistics and Information Management	Instituto Superior de Estatística e Gestão de Informação
ENSP	National School of Public Health	Escola Nacional de Saúde Pública
ITQB	Institute of Chemical and Biological Technology	Instituto de Tecnologia Química e Biológica
R	Rectorate	Reitoria
SAS	Students Welfare Services	Serviços de Acção Social
ISPA	Institute of Applied Psychology	Instituto Superior de Psicologia Alicada
OE	State Funding for Running Expenses	Orçamento do Estado de Funcionamento
PIDDAC	State Investments Plan for Central Administration Devellopment Expenses	Plano de Investimentos e Despesas de Desenvolvimento da Administração Central
Other Funds	All other funds, not included in "OE" or "PIDDAC"	Receitas Próprias
1st cycle	New programmes for Bachelor acording to Bolonha, Undergraduation programmes Pre-Bologna and Mestrado Integrado	Licenciaturas de 1º ciclo, Mestrados Integrados e Licenciaturas não adaptadas a Bolonha
2nd cycle	New programmes for Master acording to Bolonha, and Master programmes Pre-Bologna	Mestrados de 2º ciclo e Mestrados não adaptados a Bolonha
3rd cycle	New programmes for Doctorate acording to Bolonha, and other Doctotrate programmes	Cursos de Doutoramento e Programas de Doutoramento não adaptados a Bolonha
Others	Specialisation programmes (awarding a diploma not a degree)	Cursos de Especialização e outras Pós Graduações não conferentes de grau
FTE	Full Time Equivalent	ETI - Equivalente a Tempo Integral
HE	Higher Education Level	Formação com nível de Ensino Superior
Enrolled	Attending formal courses	Alunos Escolares
DIMAS	Graduate and Enrolled Students Annual Statistics	Inquérito Anual relativo aos Alunos diplomados e Inscritos no Ensino Superior
REBIDES	Annual Biographic Record of Academic Staff	Registo Biográfico dos Docentes do Ensino Superior
INDEZ	Academic and Non-Academic Staff Annual Statistics	Inquérito Anual relativo ao Pessoal Docente e Não Docente do Ensino Superior
Balanço Social	Annual Report about the Situation of the Academic and Non-Academic Staff	Balanço Social
ICI/MCTES	Facilities-related Data Inquiry	Inquérito relativo à Capacidade Instalada
Conta de Gerência	Annual Financial Report	Conta de Gerência
MCTES	Ministry of Science, Technology and Higher Education	Ministério da Ciência Tecnologia e Ensino Superior
DGES	Directorate General of Higher Education	Direcção Geral do Ensino Superior

REGISTERED NOVA STUDENTS (BY GENDER)

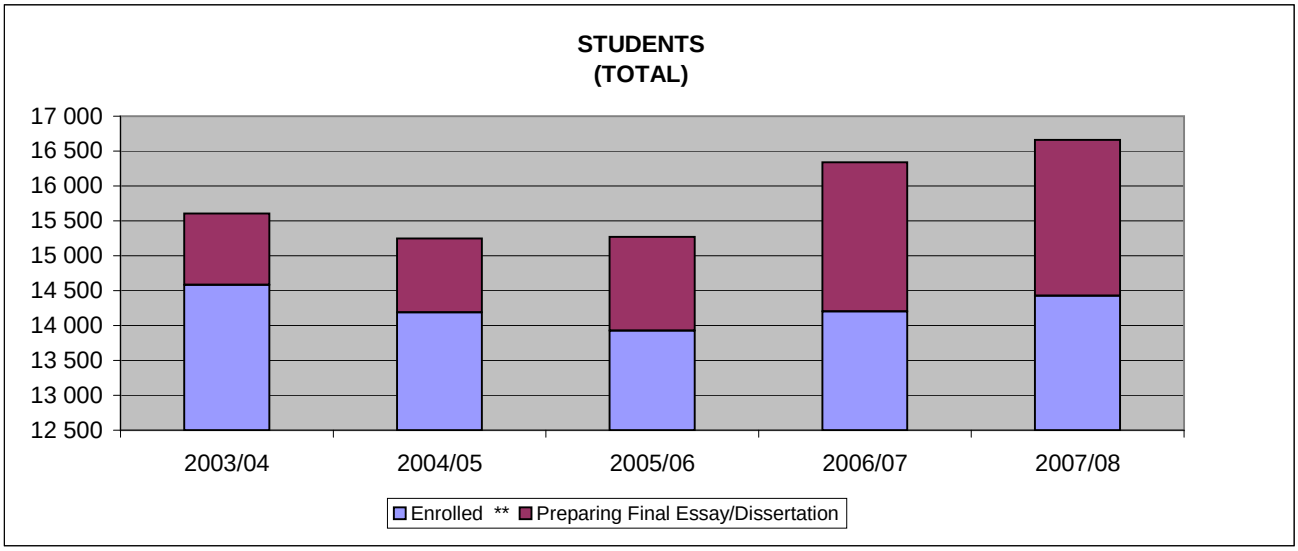
2003/2004 a 2007/2008

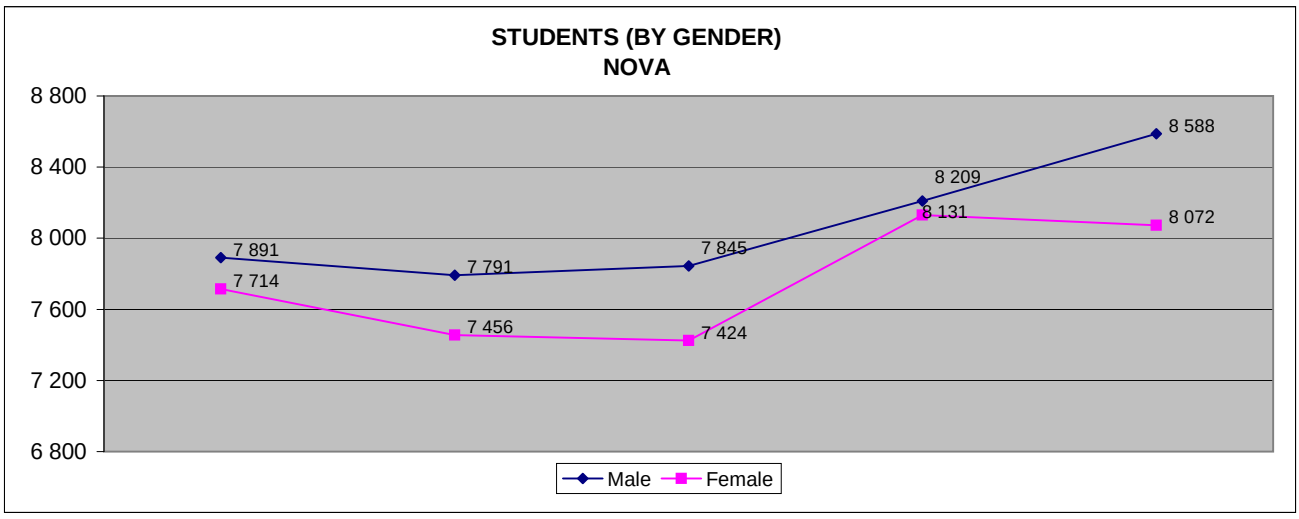
NOVA	2003/04		2004/05		2005/06		2006/07		2007/08	
	Total	M	Total	M	Total	M	Total	M	Total	M
Enrolled **	14 581	51%	14 189	52%	13 925	52%	14 200	51%	14 428	52%
Preparing Final Essay/Dissertation	1 024	41%	1 058	39%	1 344	44%	2 140	42%	2 232	46%
Total *	15 605	51%	15 247	51%	15 269	51%	16 340	50%	16 660	52%

* From all Programes

** Attending formal courses

Begining of the Bologna Process





Source: DIMAS

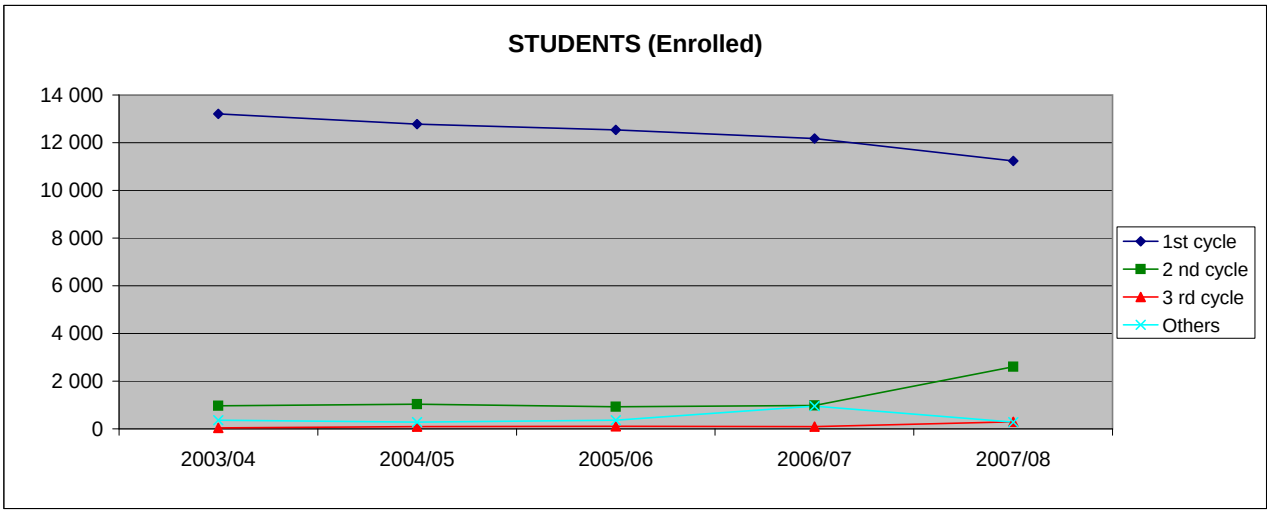
STUDENTS BY CYCLE (Enrolled)

2003/2004 a 2007/2008

Level of graduation	2003/04		2004/05		2005/06		2006/07			2007/08			
	Total	%	Total	%	Total	%	Total	%	(Total in Bologna)	Total	%	(Total in Bologna)	
1st cycle	13 210	90,6%	12 775	90,0%	12 531	90,0%	12 175	85,7%	7 304 60%	11 239	77,9%	8 174	73%
2 nd cycle	969	6,6%	1 040	7,3%	927	6,7%	978	6,9%	467 48%	2 602	18,0%	2 396	92%
3 rd cycle	38	0,3%	90	0,6%	101	0,7%	98	0,7%	29 30%	299	2,1%	59	20%
Others	364	2,5%	284	2,0%	366	2,6%	949	6,7%		288	2,0%		
Total	**14 581**	**100%**	**14 189**	**100%**	**13 925**	**100%**	**14 200**	**100%**	**7 800 55%**	**14 428**	**100%**	**10 629**	**74%**

1st cycle New programmes for 1st Cycle acording to Bologna, Mestrado Integrado and Undergraduation programmes Pre-Bologna
2 nd cycle New programmes for 2nd Cycle acording to Bologna, and Master programmes Pre-Bologna
3 rd cycle New programmes for 3rd Cycle acording to Bologna and other Doctorate Studies
Others Specialisation programmes (award a diploma not a degree)

Begining of Bologna Process



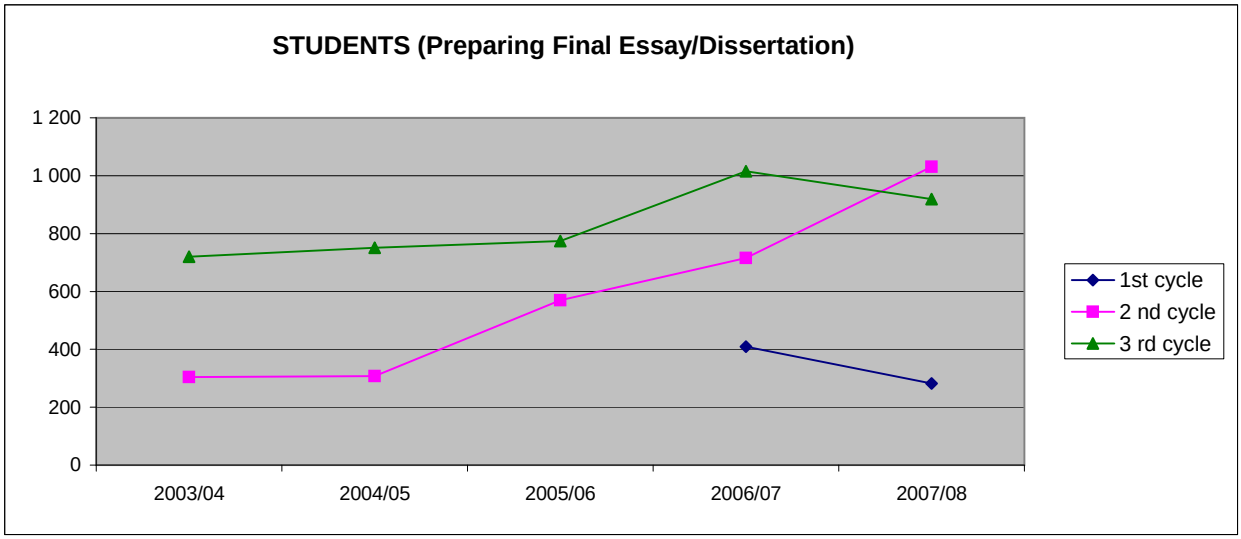
Source: DIMAS

REGISTERED STUDENTS BY CYCLE , (Preparing Final Essay/Dissertation)

2003/2004 a 2007/2008

Level of graduation	2003/04		2004/05		2005/06		2006/07		2007/08	
	Total	%	Total	%	Total	%	Total	%	Total	%
1st cycle	-		-		-		409	19,1%	282	12,6%
2 nd cycle	304	29,7%	307	29,0%	570	42,4%	716	33,5%	1 031	46,2%
3 rd cycle	720	70,3%	751	71,0%	774	57,6%	1 015	47,4%	919	41,2%
Total	**1 024**	**100%**	**1 058**	**100%**	**1 344**	**100%**	**2 140**	**100%**	**2 232**	**100%**

Begining of Bologna Process



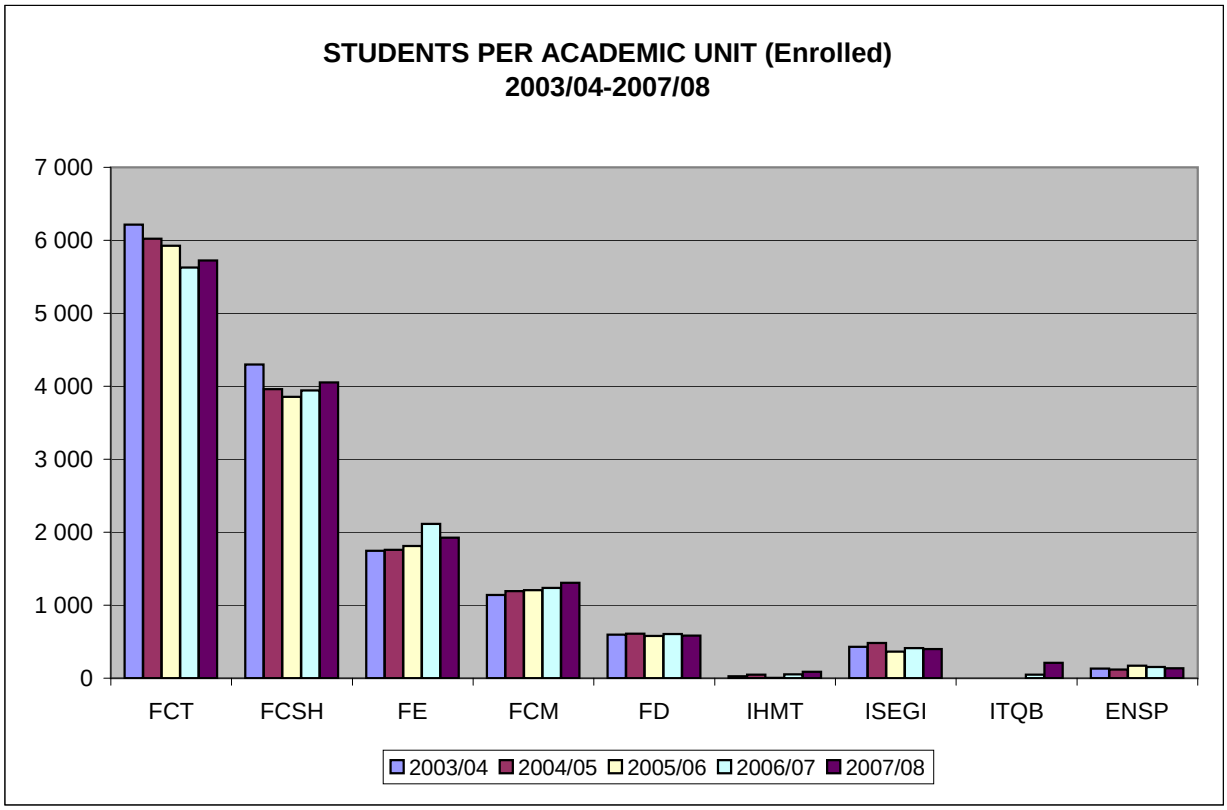
Source: DIMAS

STUDENTS PER ACADEMIC UNIT (Enrolled)

2003/2004 a 2007/2008

AU	2003/04		2004/05		2005/06		2006/07		2007/08	
	Total	M	Total	M	Total	M	Total	M	Total	M
FCT	6 213	66%	6 022	66%	5 926	67%	5 628	68%	5 723	68%
FCSH	4 297	31%	3 961	33%	3 855	34%	3 944	34%	4 054	36%
FCM	1 141	91%	1 191	86%	1 207	90%	1 235	100%	1 306	88%
FE	1 745	25%	1 757	26%	1 812	24%	2 113	21%	1 925	23%
FD	597	35%	608	42%	581	39%	607	42%	583	42%
IHMT	28	29%	49	24%	4	50%	53	25%	88	18%
ISEGI	428	62%	484	60%	362	60%	412	55%	400	57%
ITQB							50	22%	212	28%
ENSP	132	39%	117	44%	172	24%	153	39%	137	34%
R					6		5			
NOVA	**14 581**	**51%**	**14 189**	**52%**	**13 925**	**52%**	**14 200**	**51%**	**14 428**	**52%**

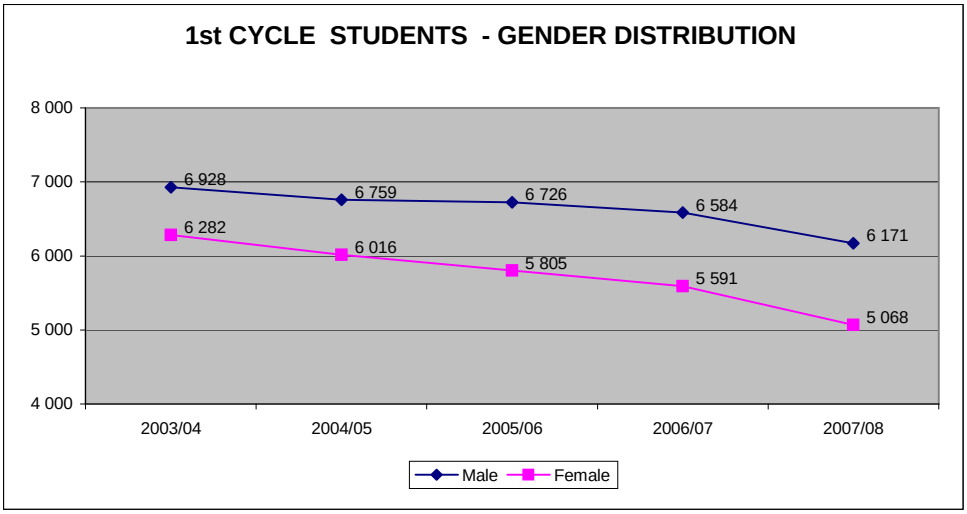
* MPA (Master of Public Administration) - single edition

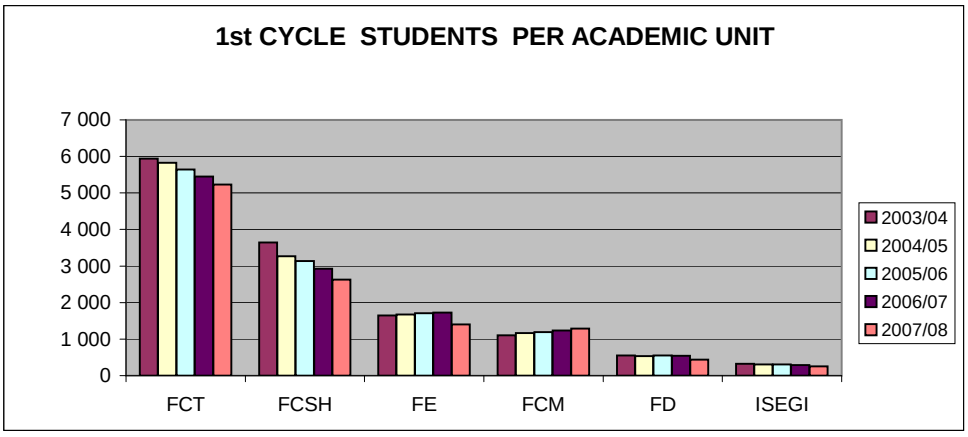


Source: DIMAS

1st CYCLE STUDENTS PER ACADEMIC UNIT AND GENDER DISTRIBUTION (Enrolled)

AU	2003/04		2004/05		2005/06		2006/07		2007/08	
	TOTAL	M	TOTAL	M	TOTAL	M	TOTAL	M	TOTAL	M
FCT	5 940	67%	5 829	66%	5 640	68%	5 449	68%	5 227	69%
FCSH	3 647	31%	3 269	33%	3 139	34%	2 927	35%	2 626	38%
FE	1 648	59%	1 671	58%	1 706	59%	1 725	59%	1 400	58%
FCM	1 106	39%	1 161	39%	1 190	37%	1 235	36%	1 286	35%
FD	549	35%	538	38%	550	39%	547	38%	442	38%
ISEGI	320	66%	307	63%	306	60%	292	56%	258	55%
NOVA	13 210	52%	12 775	53%	12 531	54%	12 175	54%	11 239	55%



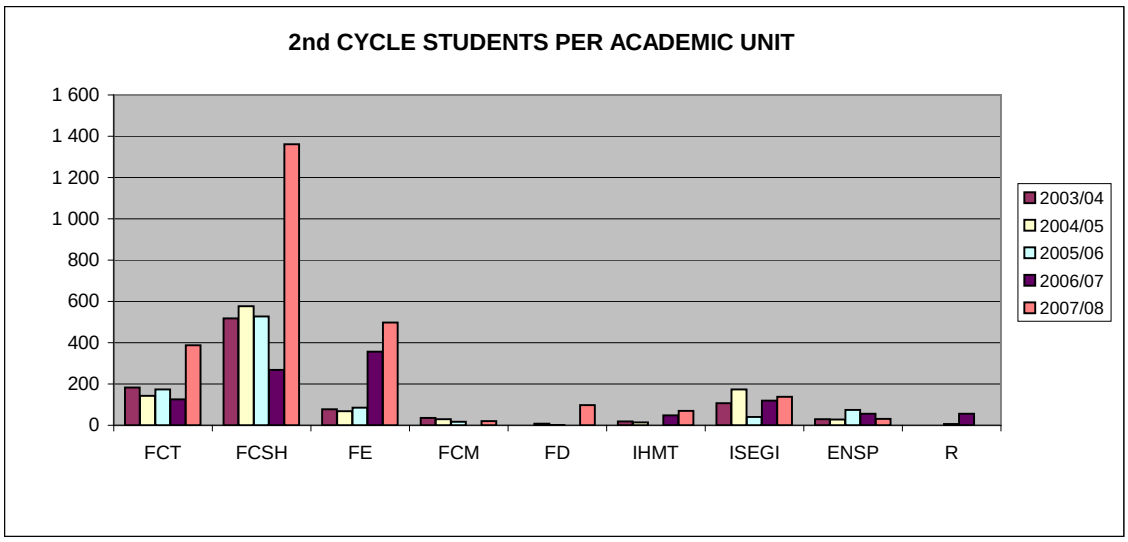


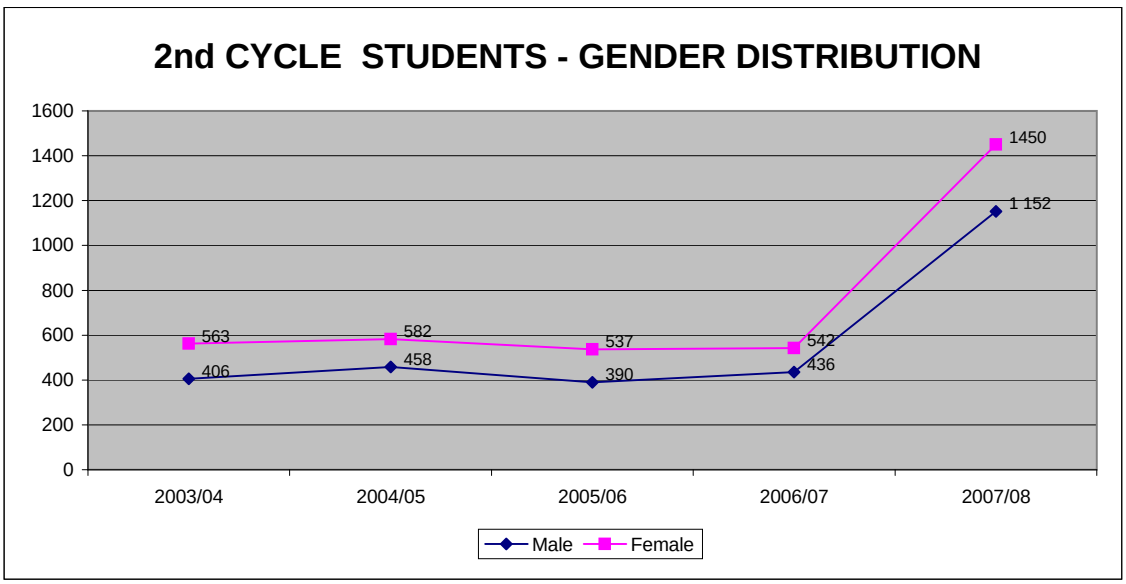
Source: DIMAS

2nd CYCLE STUDENTS PER ACADEMIC UNIT AND GENDER DISTRIBUTION (Enrolled)

AU	2003/04		2004/05		2005/06		2006/07		2007/08	
	Total	M	Total	M	Total	M	Total	M	Total	M
FCT	183	52%	143	56%	173	51%	126	53%	387	63%
FCSH	518	34%	577	35%	527	35%	268	31%	1361	32%
FE	77	78%	68	79%	86	76%	356	54%	497	65%
FCM	35	26%	30	27%	17	24%	–		20	25%
FD	–		7	71%	2	50%	–		98	41%
IHMT	19	21%	14	36%	–		48	25%	70	20%
ISEGI	107	51%	173	54%	41	56%	119	52%	138	63%
ENSP	30	23%	28	39%	75	32%	56	29%	31	23%
R	–		–		6	17%	5	20%	–	
NOVA	**969**	**42%**	**1 040**	**44%**	**927**	**42%**	**978**	**45%**	**2 602**	**44%**

* MPA (Master of Public Administration) - single edition

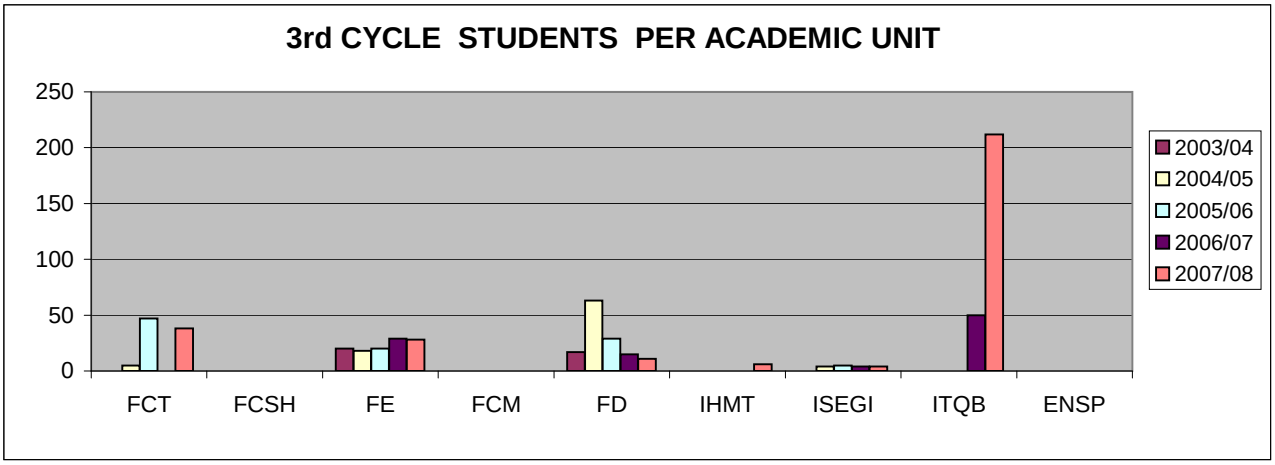


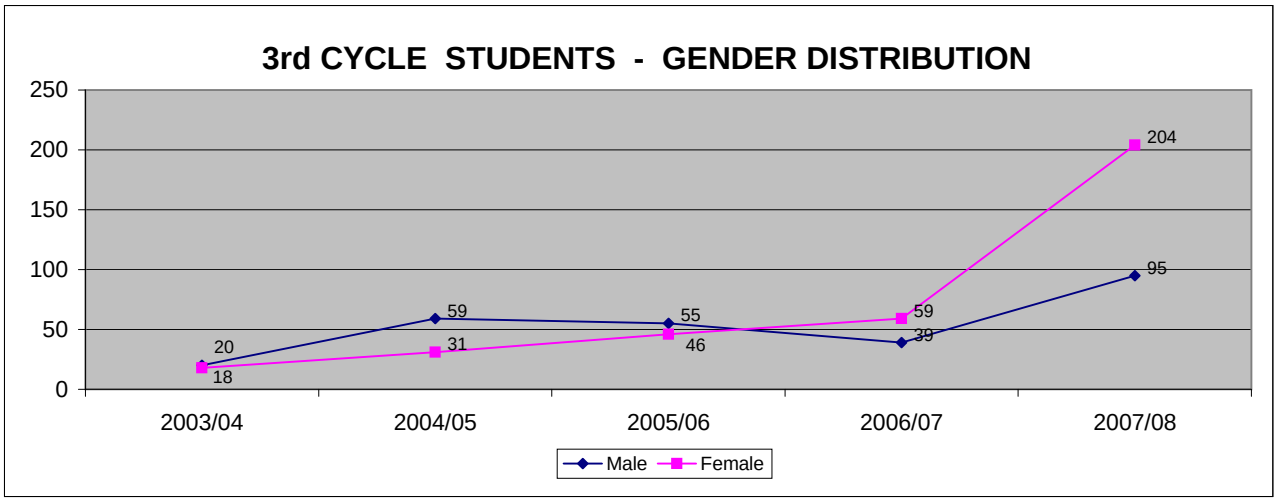


Source: DIMAS

3rd CYCLE STUDENTS PER ACADEMIC UNIT AND GENDER DISTRIBUTION (Enrolled in Doctoral Programmes)

AU	2003/04		2004/05		2005/06		2006/07		2007/08	
	Total	M	Total	M	Total	M	Total	M	Total	M
FCT	-		5	20%	47	57%	-		38	29%
FCSH	-		-		-		-		-	
FE	20	50%	18	50%	20	50%	29	66%	28	64%
FCM	-		-		-		-			
FD	17	53%	63	71%	29	52%	15	53%	11	45%
IHMT	-		-		-		-		6	17%
ISEGI	-		4	100%	5	60%	4	25%	4	25%
ITQB	-		-		-		50	22%	212	28%
ENSP	-		-		-		-		-	
NOVA	**37**	**54%**	**90**	**66%**	**101**	**54%**	**98**	**40%**	**299**	**32%**





Source: DIMAS

STUDENTS PREPARING FINAL ESSAY/DISSERTATION PER ACADEMIC UNIT AND GENDER DISTRIBUTION

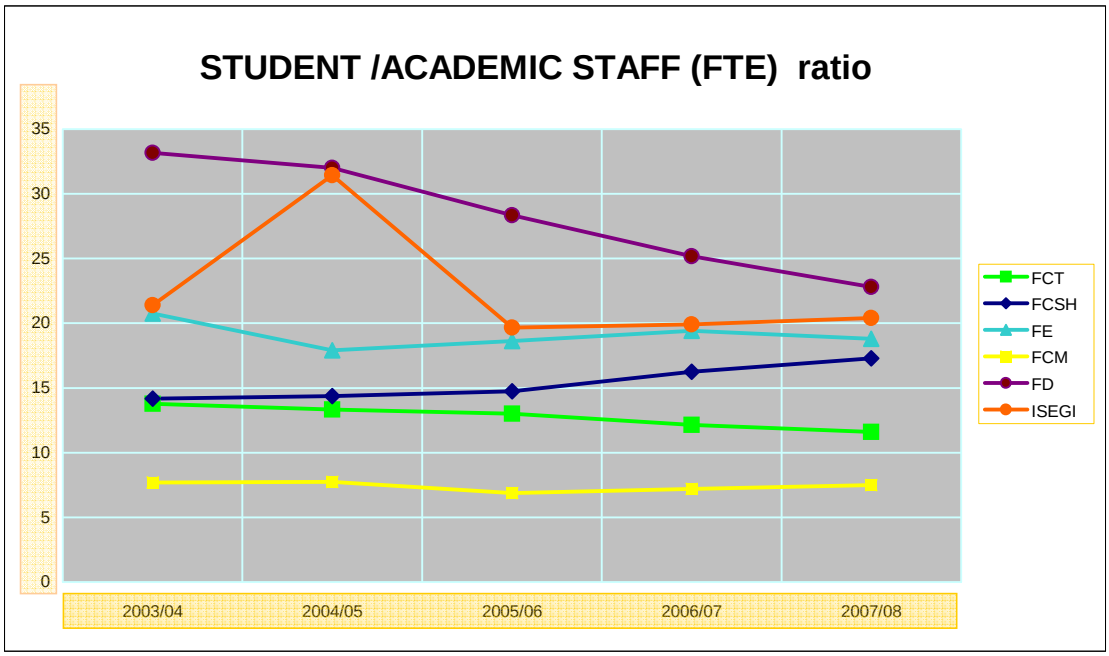
AU	2003/04				2004/05				2005/06				2006/07						2007/08					
	2nd Cycle Pré-Bologna (Mestrado)		Doctoral Studies Pré-Bologna (Doutoramento)		2nd Cycle Pré-Bologna (Mestrado)		Doctoral Studies Pré-Bologna (Doutoramento)		2nd Cycle Pré-Bologna (Mestrado)		Doctoral Studies Pré-Bologna (Doutoramento)		1st Cycle (Mestrado Integrado)		2nd Cycle and Graduate Studies Pré-Bologna (Mestrado)		3th Cycle and Doctoral Studies Pré-Bologna (Doutoramento)		1st Cycle (Mestrado Integrado)		2nd Cycle and Graduate Studies Pré-Bologna (Mestrado)		3th Cycle and Doctoral Studies Pré-Bologna (Doutoramento)	
	Total	M	Total	M	Total	M	Total	M	Total	M	Total	M	Total	M	Total	M	Total	M	Total	M	Total	M	Total	M
FCT	43	49%	68	41%	27	41%	53	41%	88	40%	47	57%	409	47%	143	54%	196	52%	282	52%	397	61%	200	51%
FCSH	166	30%	419	45%	217	37%	483	44%	293	35%	509	45%	-		274	34%	447	45%	-		254	31%	550	43%
FE	7	71%	-		10	60%	-		11	64%	-		-		9	67%	15	53%	-		38	39%	15	73%
FCM	-		15	67%	9	33%	23	39%	-		5	80%	-		80	29%	54	57%	-		72	28%	52	48%
FD	7	57%	51	57%	-		27	52%	-		37	59%	-		3	33%	54	59%	-		26	77%	65	57%
IHMT	-		22	18%	17	18%	37	24%	13	31%	5	0%	-		-		20	40%	-		39	23%	-	
ISEGI	54	52%	-		-		-		123	53%	-		-		97	45%	6	67%	-		116	47%	5	80%
ITQB	-		144	31%	-		177	31%	-		196	27%	-		20	10%	195	27%	-		-		-	
ENSP	27	22%	1	0%	27	19%	4	25%	42	31%	22	50%	-		90	28%	28	14%	-		84	29%	32	38%
R	-		-		-		-		-		-		-		-		-		-		5 *	20%	-	
NOVA	**304**	**37%**	**720**	**42%**	**307**	**36%**	**804**	**37%**	**570**	**40%**	**821**	**42%**	**409**	**47%**	**716**	**38%**	**1 015**	**44%**	**282**	**52%**	**1 031**	**45%**	**919**	**46%**

* MPA (Master of Public Administration) - single edition

Source: DIMAS

ENROLLED STUDENTS / ACADEMIC STAFF (FTE) ratio

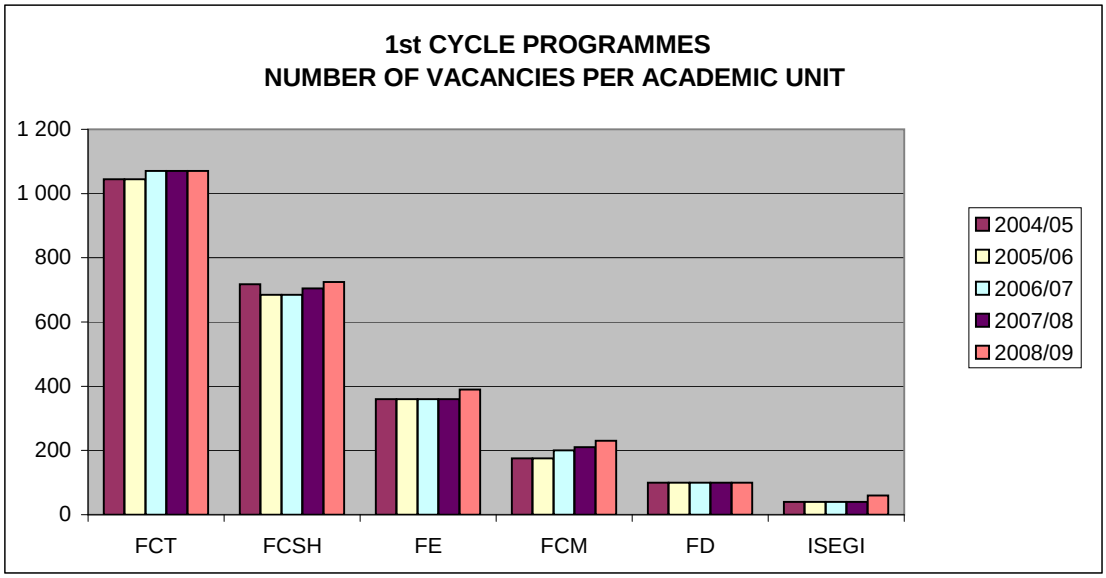
	AU	2003/04	2004/05	2005/06	2006/07	2007/08
	FCT	13,8	13,3	13,0	12,1	11,6
	FCSH	14,2	14,4	14,7	16,3	17,3
	FE	20,7	17,9	18,6	19,4	18,8
	FCM	7,7	7,8	6,9	7,2	7,5
	FD	33,2	32,0	28,3	25,2	22,8
	IHMT	0,8	1,4	0,1	1,6	2,6
	ISEGI	21,4	31,4	19,7	19,9	20,4
	ENSP	5,0	4,6	6,7	6,1	5,8
NOVA	simple average	**13,3**	**13,0**	**12,6**	**12,8**	**12,9**
	weighted average	**13,0**	**15,3**	**13,5**	**13,5**	**13,3**

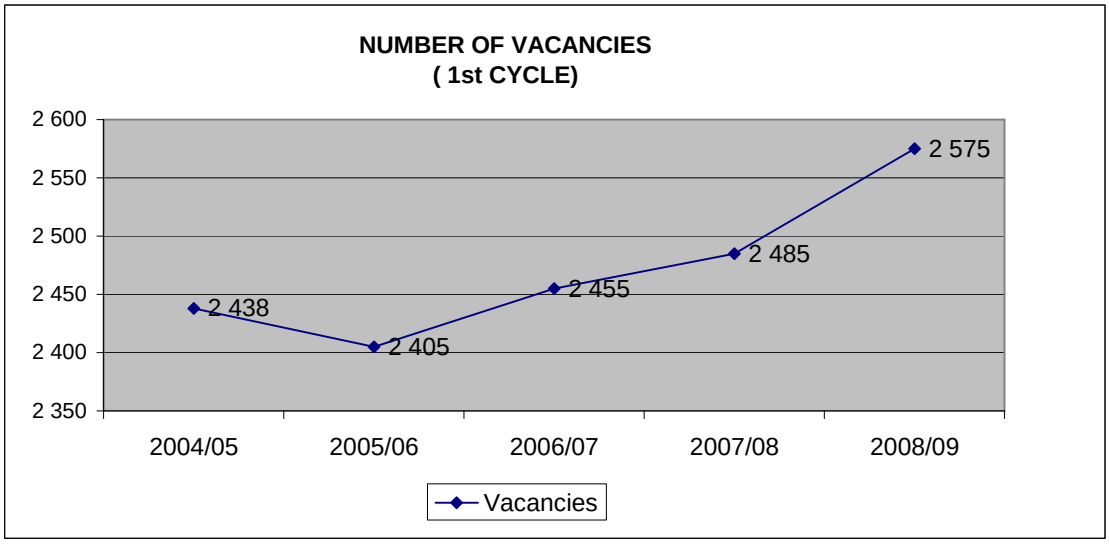


Source: DIMAS/INDEZ/REBIDES

1st CYCLE PROGRAMMES ACCESS
NUMBER OF VACANCIES PER ACADEMIC UNIT

AU	2004/05	2005/06	2006/07	2007/08	2008/09
FCT	1 045	1 045	1 070	1 070	1 070
FCSH	718	685	685	705	725
FE	360	360	360	360	390
FCM	175	175	200	210	230
FD	100	100	100	100	100
ISEGI	40	40	40	40	60
NOVA	**2 438**	**2 405**	**2 455**	**2 485**	**2 575**





Source: AU

1st CYCLE ACCESS - DATA CONCERNING THE NATIONAL PROCEDURE FOR PUBLIC UNIVERSITIES ACCESS
NOVA - 2004 - 2008

	2004	2005	2006	2007	2008
1. Vacancies	2 438	2 405	2 455	2 485	2 575
2. Total number of candidates	11 472	11 283	11 415	18 132	18 197
3. Vacancies occupied	1 998	1 869	1 863	2 416	2 494
1st option (%)	71,4	70,1	76,0	67,0	63,6
1st+ 2nd option (%)	87,0	85,2	87,0	82,0	80,0
4. Rating to access *	105,2	103,6	101,0	104,5	102,8
5. Average rating **	149,2	129,4	150,3	159,9	145,2

*Rating to acces: Classification (Maximum of 200) of the last student assigned;

**Average rating: Average classification of all students assigned;

The rating to access considers the classifications got by students at the last three years of secondary school and the grades obtained in national assessment tests. That rating is the basis to establish a serial order wich allows the MCTES to assign the students to the available places in the higher education institutions, in accordance with 6 options of preferred courses indicated by each student.

Source: DGES

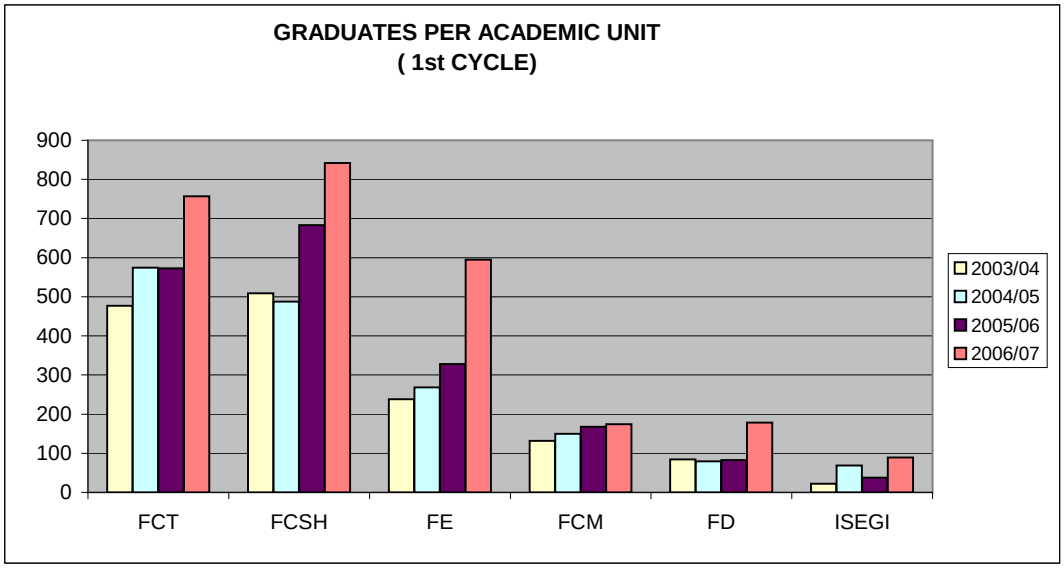
1st CYCLE ACCESS - GEOGRAPHICAL AREA OF INFLUENCE

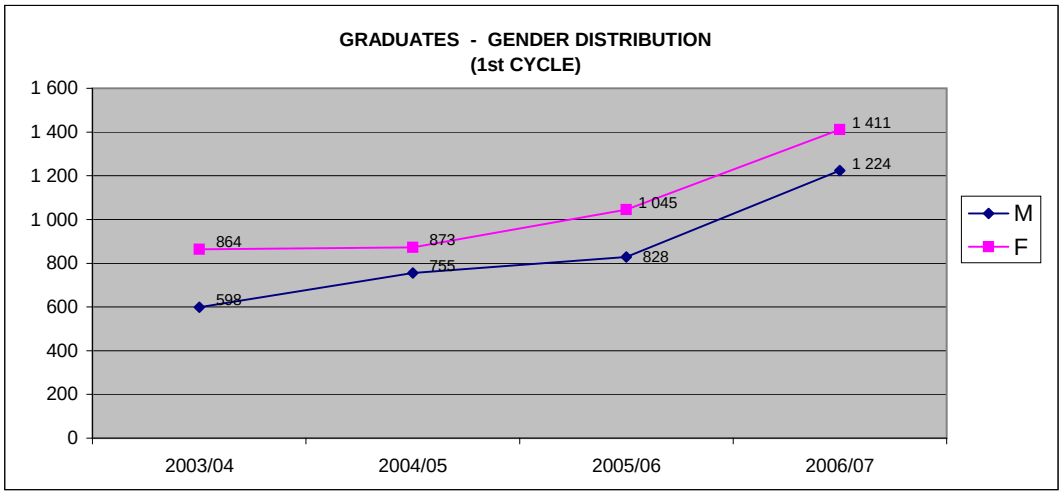
GEOGRAPHICAL AREA		2004		2005		2006		2007		2008	
		N.º	%	N.º	%	N.º	%	N.º	%	N.º	%
1. Lisboa	candidates	5 084	44	4 814	43	4 674	41	7 850	43	8521	47
	admitted	1 000	50	882	47	857	46	1 171	48	1187	48
2. Setúbal	candidates	1 550	14	1 575	14	1 579	14	2 578	14	2858	16
	admitted	362	18	365	20	355	19	445	18	495	20
3. Santarém	candidates			580	5	601	5	893	5	1015	6
	admitted			114	6	107	6	118	5	163	7
4. Other	candidates	4 838	42	4 314	38	4 561	40	6 811	38	5 803	32
	admitted	636	32	508	27	544	29	682	28	649	26
Total	candidates	11 472	100	11 283	100	11 415	100	18 132	100	18 197	100
	admitted	1 998	100	1 869	100	1 863	100	2 416	100	2 494	100

Source: DGES

GRADUATES PER ACADEMIC UNIT AND GENDER DISTRIBUTION
(1st CYCLE)

AU	2003/04		2004/05		2005/06		2006/07	
	Total	M	Total	M	Total	M	Total	M
FCT	477	60%	574	58%	573	58%	757	62%
FCSH	509	20%	488	30%	683	25%	842	30%
FE	238	57%	268	54%	328	62%	595	53%
FCM	132	32%	150	43%	168	39%	174	43%
FD	84	21%	79	37%	83	34%	178	33%
ISEGI	22	64%	69	57%	38	66%	89	57%
NOVA	1 462	41%	1 628	46%	1 873	44%	2 635	46%

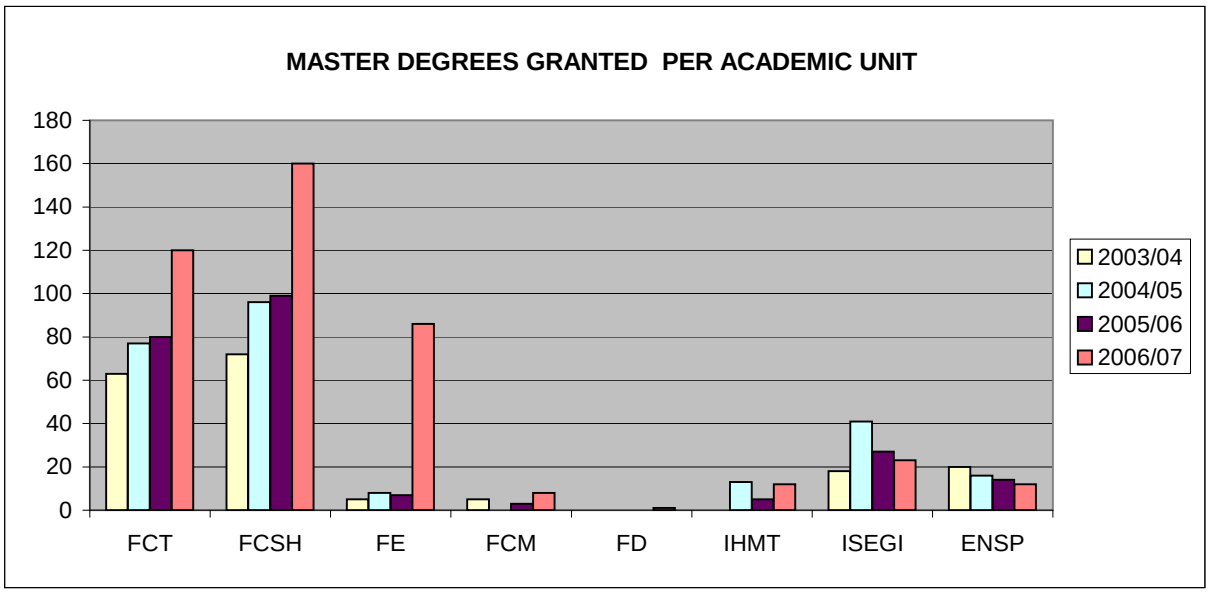


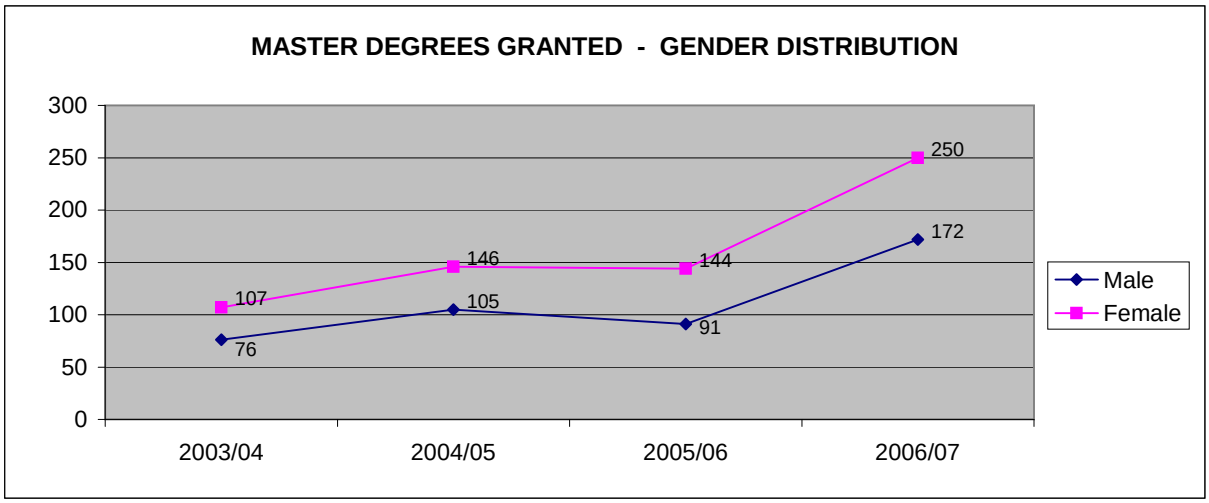


Source: DIMAS

MASTER DEGREES GRANTED PER ACADEMIC UNIT AND GENDER DISTRIBUTION

AU	2003/04		2004/05		2005/06		2006/07	
	Total	M	Total	M	Total	M	Total	M
FCT	63	59%	77	51%	80	41%	120	48%
FCSH	72	32%	96	30%	99	29%	160	28%
FE	5	40%	8	75%	7	71%	86	55%
FCM	5	60%	–		3	33%	8	38%
FD	–		–		–		1	100%
IHMT	–		13	31%	5	40%	12	17%
ISEGI	18	28%	41	56%	27	70%	23	48%
ENSP	20	30%	16	25%	14	14%	12	42%
NOVA	183	42%	251	42%	235	39%	422	41%

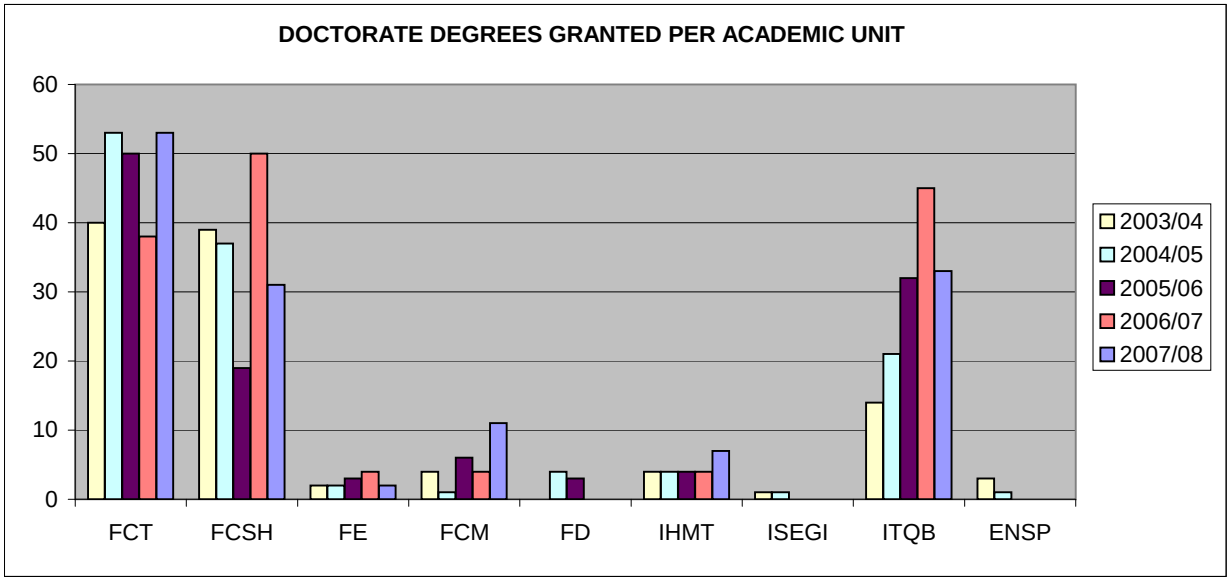


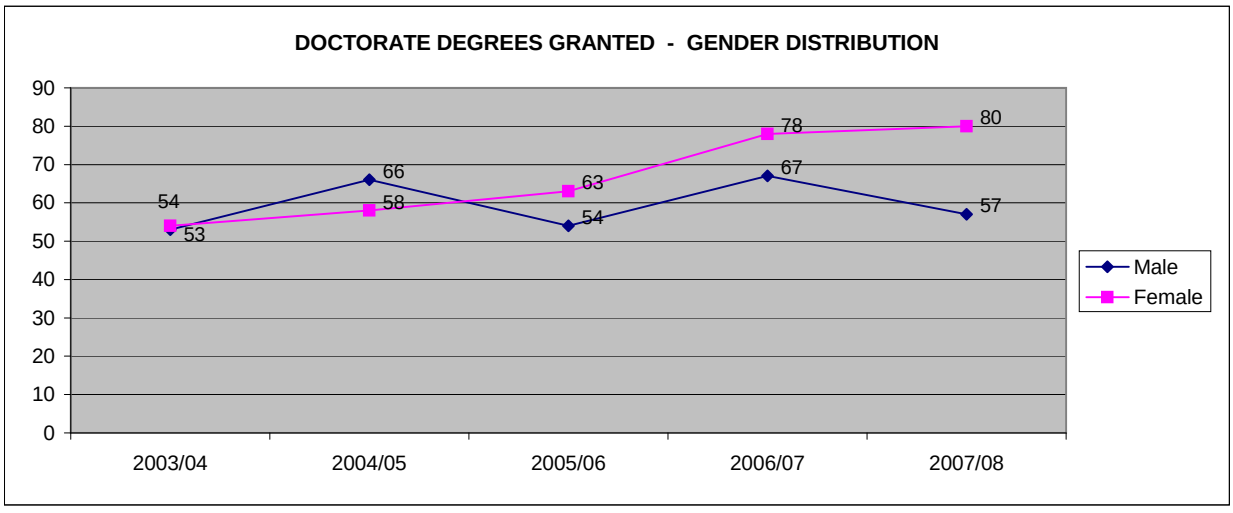


Source: DIMAS

DOCTORATE DEGREES GRANTED PER ACADEMIC UNIT
AND GENDER DISTRIBUTION

AU	2003/04		2004/05		2005/06		2006/07		2007/08(*)	
	Total	M	Total	M	Total	M	Total	M	Total	M
FCT	40	55%	53	62%	50	52%	38	58%	53	51%
FCSH	39	46%	37	46%	19	53%	50	50%	31	39%
FE	2	100%	2	50%	3	33%	4	50%	2	100%
FCM	4	50%	1	100%	6	50%	4	100%	11	45%
FD	–		4	25%	3	33%	–		–	
IHMT	4	25%	4	75%	4	75%	4	0%	7	0%
ISEGI	1	100%	1	100%	–		–		–	
ITQB	14	29%	21	38%	32	31%	45	31%	33	33%
ENSP	3	100%	1	100%	–		–		–	
NOVA	107	50%	124	53%	117	46%	145	46%	137	42%





Source: DIMAS; (*)Acad.Serv/R

TIME TO GRADUATION PER ACADEMIC UNIT

(1st Cycle)

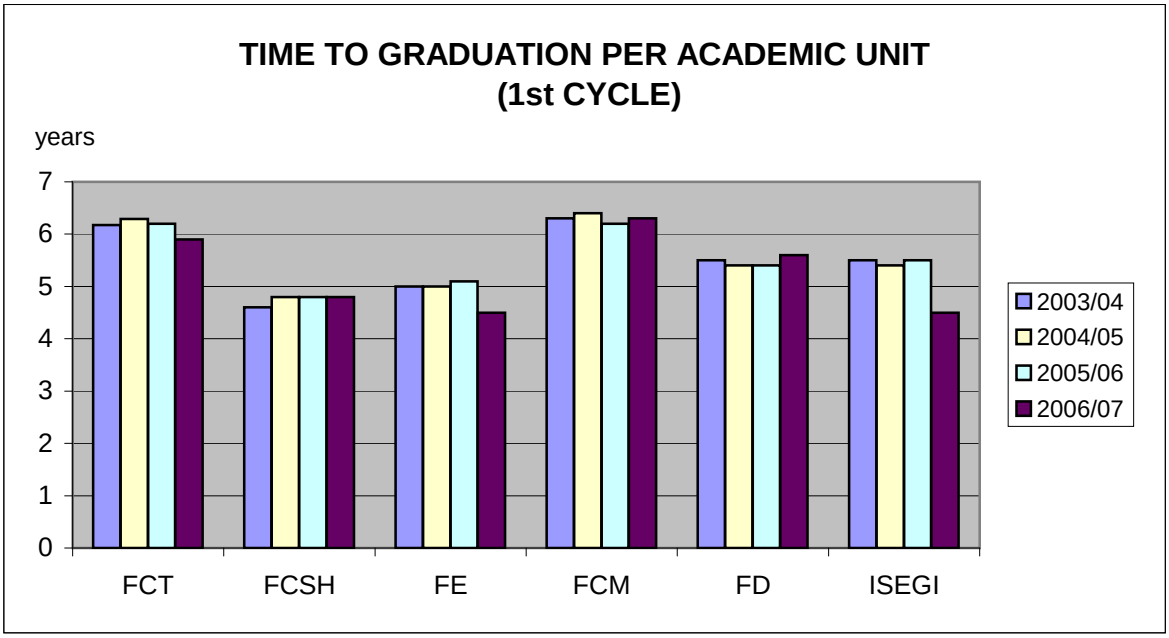
("Time to Graduation" = Average duration of study of the Graduates

= [(number of graduates who complete the study in n years * n)+(number of graduates who complete the study in n+1 years * n+1)+(number of graduates who complete the study in n+2 years * n+2)+(number of graduates who complete the study in n+... years * n+x..)]/total graduates;

n = nominal duration of the Programme)

(years)

AU	n	2003/04	2004/05	2005/06	2006/07
FCT	**5**	6,2	6,3	6,2	5,9
FCSH	**4**	4,6	4,8	4,8	4,8
FE	**5**	5,0	5,0	5,1	4,5
FCM	**6**	6,3	6,4	6,2	6,3
FD	**5**	5,5	5,4	5,4	5,6
ISEGI	**4**	5,5	5,4	5,5	4,5



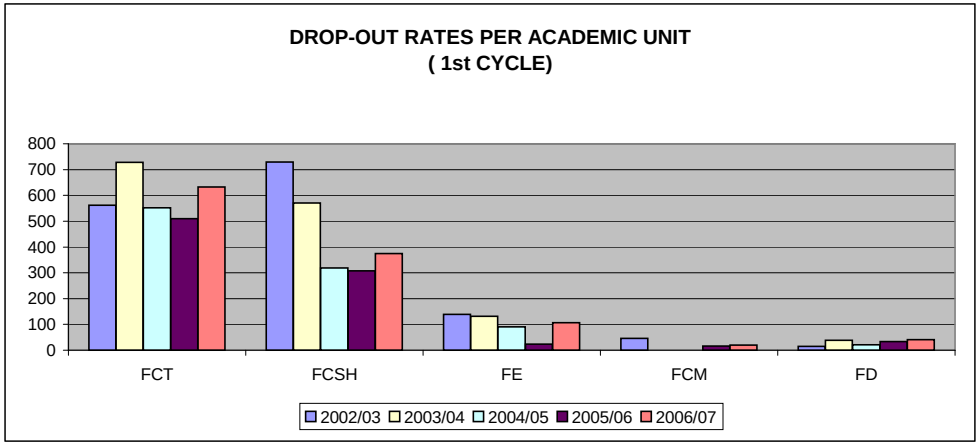
Source: DIMAS

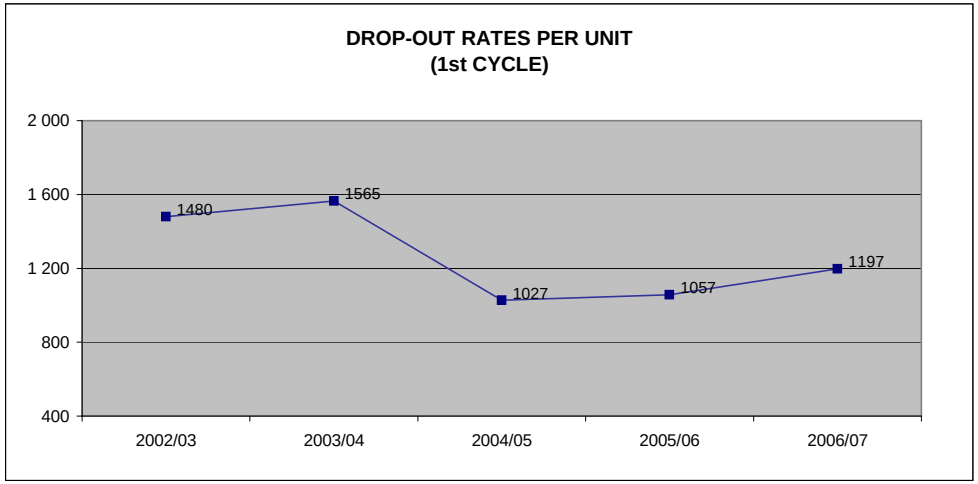
DROP-OUT RATES PER ACADEMIC UNIT (1st CYCLE)

"Drop-Out" = Enrolled - Graduate + Freshmen - New Enrolled;
"Going-out" = Graduate + Drop-out

AU		N. Drop-out	% Drop-out /Enrolled	%Drop-out Going-out
FCT	2002/03	562	10%	57%
	2003/04	728	13%	61%
	2004/05	552	10%	49%
	2005/06	510	9%	48%
	2006/07	632	12%	46%
FCSH	2002/03	729	19,5%	67,4%
	2003/04	570	16,7%	58,3%
	2004/05	319	10,4%	39,5%
	2005/06	307	10,4%	34,2%
	2006/07	374	13,3%	32,6%
FE	2002/03	139	8,5%	38,4%
	2003/04	131	7,9%	35,5%
	2004/05	91	5,4%	25,3%
	2005/06	23	1,3%	6,6%
	2006/07	107	6,2%	15,2%
FCM	2002/03	46	4,3%	29,7%
	2003/04	0	0,0%	0,0%
	2004/05	0	0,0%	0,0%
	2005/06	16	1,3%	8,7%
	2006/07	20	1,6%	10,3%
FD	2002/03	15	2,8%	15,8%
	2003/04	39	7,1%	31,7%
	2004/05	21	3,9%	21,0%
	2005/06	33	6,0%	28,4%
	2006/07	41	7,5%	18,7%
ISEGI	2002/03	22	0,0%	41,5%
	2003/04	72	0,0%	76,6%
	2004/05	15	0,1%	17,9%
	2005/06	48	0,0%	55,8%
	2006/07	23	0,1%	20,5%
NOVA	2002/03	1480	11,4%	54,6%
	2003/04	1565	12,1%	53,5%
	2004/05	1027	8,2%	38,7%
	2005/06	1057	8,6%	37,5%
	2006/07	1197	9,9%	31,8%

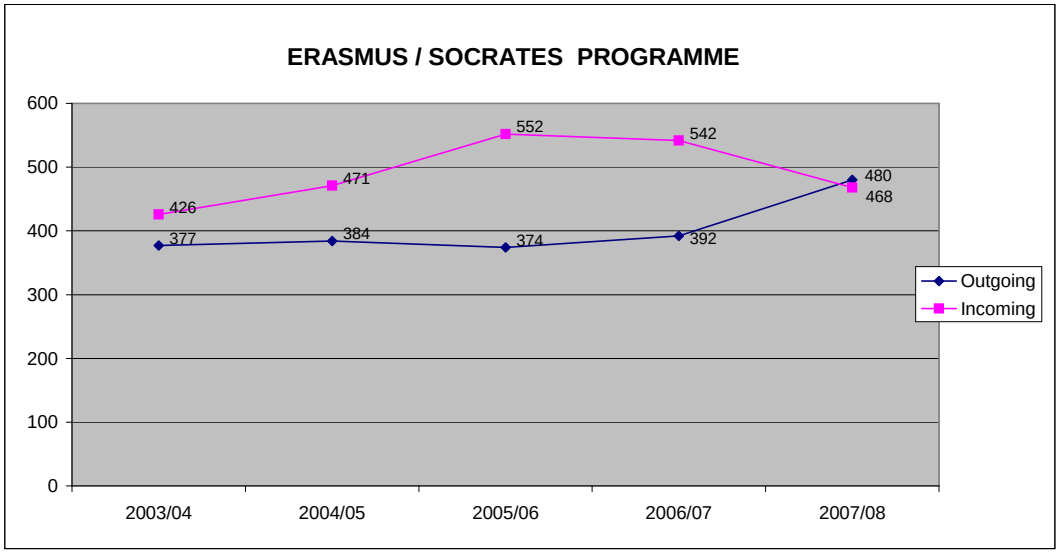
Source: DIMAS





ERASMUS / SOCRATES PROGRAMME

AU	2003/04		2004/05		2005/06		2006/07		2007/08	
	OUTGOING STUDENTS	INCOMING STUDENTS	OUTGOING STUDENTS	INCOMING STUDENTS	OUTGOING STUDENTS	INCOMING STUDENTS	OUTGOING STUDENTS	INCOMING STUDENTS	OUTGOING STUDENTS	INCOMING STUDENTS
FCT	62	60	61	64	61	69	67	56	89	66
FCSH	101	214	109	238	106	285	105	299	111	154
FE	143	120	143	140	160	147	167	154	224	197
FCM	31	15	32	12	28	22	28	18	32	24
FD	38	16	37	14	18	26	25	14	23	12
ISEGI	2	1	2	3	1	3	0	1	1	5
TOTAL	**377**	**426**	**384**	**471**	**374**	**552**	**392**	**542**	**480**	**468**



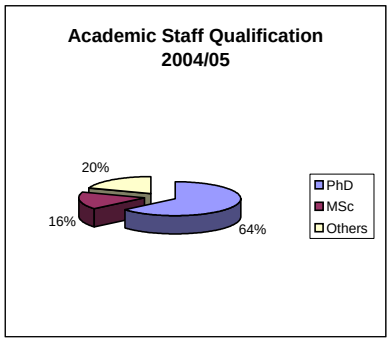
ERASMUS/SOCRATES "OUTGOING STUDENTS" / 1st CYCLE STUDENTS PER ACADEMIC UNIT (%)

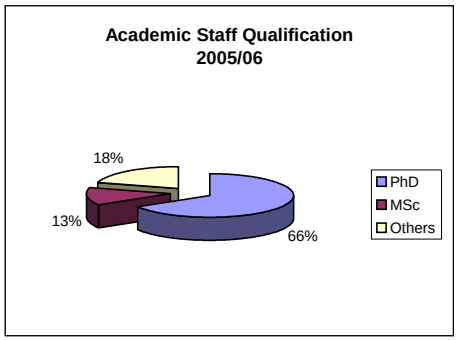
AU	2003/04		2004/05		2005/06		2006/07		2007/08	
	1stCycle Students	OutG.Stud./ 1stCyStud.	1stCycle Students	OutG.Stud./ 1stCyStud.	1stCycle Students	OutG.Stud./ 1stCyStud.	1stCycle Students	OutG.Stud./ 1stCyStud.	1stCycle Students	OutG.Stud./ 1stCyStud.
FCT	5940	1,0%	5829	1,0%	5640	1,1%	5449	1,2%	5227	1,7%
FCSH	3647	2,8%	3269	3,3%	3139	3,4%	2927	3,6%	2626	4,2%
FE	1648	8,7%	1671	8,6%	1706	91,1%	1725	9,7%	1400	16,0%
FCM	1106	2,8%	1161	2,8%	1190	2,4%	1235	2,3%	1286	2,5%
FD	549	6,9%	538	6,9%	550	3,3%	547	4,6%	442	5,2%
ISEGI	320	0,6%	307	0,7%	306	0,3%	292	0,0%	258	0,4%
TOTAL	**13210**	**2,9%**	**12775**	**3,1%**	**12531**	**2,9%**	**12175**	**3,2%**	**11239**	3,7%

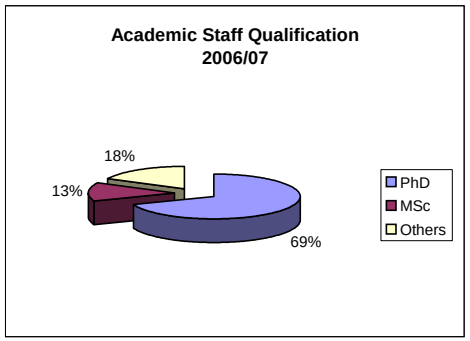
Source: Gab.Plan./Gab.Bologna/R

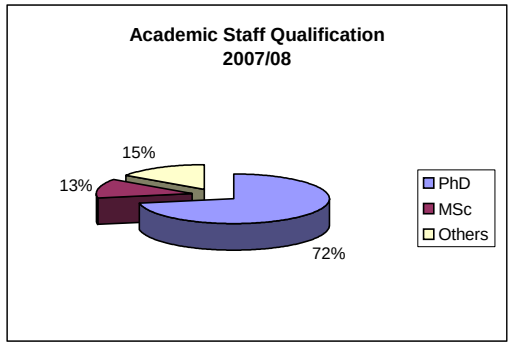
ACADEMIC STAFF QUALIFICATION PER ACADEMIC UNIT (FTE)

AU	ACADEMIC STAFF PER ACADEMIC UNIT (FTE)														
	Total					MSc				PhD					
	2003/04	2004/05	2005/06	2006/07	2007/08	2004/05	2005/06	2006/07	2007/08	2003/04	2004/05	2005/06	2006/07	2007/08
FCT	447,2	448, 9	455, 6	463, 5	491, 6	91,4	108,1	76,3	73,1	278,5	303,6	324,9	355,1	390,4
FCSH	303,3	277, 5	261, 4	242, 6	234, 8	39,4	30,5	23,6	22,2	204,8	205,6	206,0	197,7	198,4
FE	84,1	101, 1	97, 3	98, 5	102, 4	19,2	15,6	12,7	17,5	44,0	51,1	54,9	56,5	58,9
FCM	148,2	155, 6	175, 3	171, 6	173, 9	8,8	8,8	11,6	11,4	51,9	57,6	60,8	58,9	69,2
FD	18,0	19, 0	20, 5	24, 1	25, 6	4,0	2,7	4,0	4,2	14,0	14,0	16,6	20,1	20,5
IHMT	33,1	34, 9	33, 7	33, 7	34, 3	2,7	3,0	3,2	3,2	23,9	29,2	29,3	29,1	29,7
ISEGI	20,0	15, 4	18, 4	20, 7	19, 6	5,4	7,5	8,2	6,0	9,3	7,1	8,8	11,9	12,7
ITQB	13,5	13, 7	14, 1	10, 5	9, 7	0,0	0,0	0,0	0,0	13,5	13,7	14,1	10,5	9,7
ENSP	26,4	25, 6	25, 8	24, 9	23, 7	4,9	2,2	4,7	3,8	13,0	14,9	15,9	15,2	15,2
R			1,0	1,0	1,0				0,0			1,0	1,0	1,0
TOTAL	**1 093,8**	**1 091,7**	**1 103,1**	**1 091,1**	**1 116,5**	**175,8**	**178,4**	**144,3**	**141,4**	**652,9**	**696,8**	**732,3**	**756,0**	**805,7**









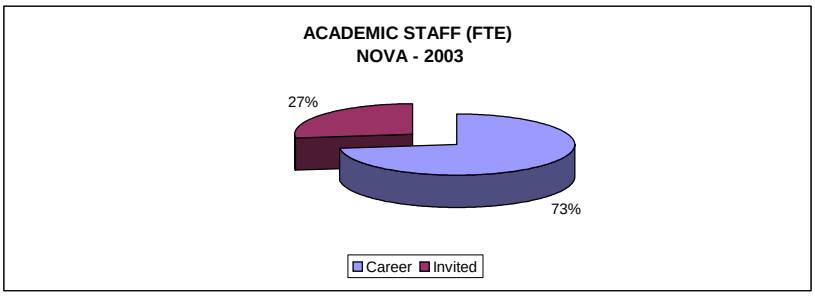
Source: INDEZ/REBIDES

ACADEMIC STAFF BY RANK AND ACADEMIC UNIT
2003

AU	Full Professor		Associate Professor		Assistant Professor		Assistant		Lecturer	Monitors	Others	Total		
	Career	Invited	Career	Invited	Career	Invited	Career	Invited				Career	Invited	Total
FCT	30	4	51	3	194	20	133	31	3	6	13	408	80	**488**
FCSH	34	0	53	2	130	6	45	48	17	0	11	262	84	**346**
FE	13	1	9	5	8	34	15	24	0	1	0	45	65	**110**
FCM	14	2	12	16	14	36	5	203	0	16	1	45	274	**319**
FD	2	0	6	0	7	0	0	4	0	0	0	15	4	**19**
IHMT	3	2	1	0	17	5	8	1	0	0	0	29	8	**37**
ISEGI	3	1	1	1	2	12	12	0	0	0	0	18	14	**32**
ITQB	6	7	2	1	0	5	0	0	0	0	1	8	14	**22**
ENSP	2	0	10	1	1	7	1	15	0	0	0	14	23	**37**
NOVA	**107**	**17**	**145**	**29**	**373**	**125**	**219**	**326**	**20**	**23**	**26**	**844**	**566**	**1 410**

ACADEMIC STAFF (FTE) BY RANK AND ACADEMIC UNIT
2003

AU	Full Professor		Associate Professor		Assistant Professor		Assistant		Lecturer	Monitors	Others	Total		
	Career	Invited	Career	Invited	Career	Invited	Career	Invited				Career	Invited	Total
FCT	29	1,7	50	1,7	189	11,2	131	18,7	1,6	0,3	13	399	48,2	**447,2**
FCSH	32	0	48	0,8	123	2,5	40	29,9	16,1	0	11	243	60,3	**303,3**
FE	11	0,6	8	3,2	8	22	14	17,3	0	0	0	41	43,1	**84,1**
FCM	11	0,8	10	5	14	12,8	5	83,8	0	4,8	1	40	108,2	**148,2**
FD	2	0	5	0	7	0	0	4	0	0	0	14	4	**18,0**
IHMT	3	1,5	1	0	16	3,1	8	0,5	0	0	0	28	5,1	**33,1**
ISEGI	3	0,5	1	0,3	2	3,4	8	0	0	1,8	0	14	6	**20,0**
ITQB	6	0,5	2	0	0	4	0	0	0	0	1	8	5,5	**13,5**
ENSP	2	0	9	1	1	3,5	1	8,9	0	0	0	13	13,4	**26,4**
NOVA	**99**	**5,6**	**134**	**12**	**360**	**62,5**	**207**	**163,1**	**17,7**	**6,9**	**26,0**	**800**	**293,8**	**1 093,8**



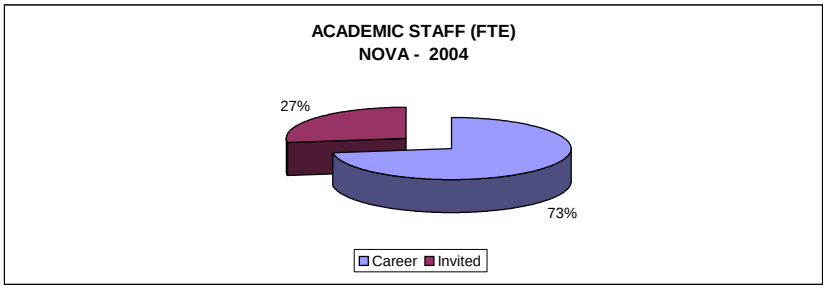
Source: INDEZ/REBIDES

ACADEMIC STAFF BY RANK AND ACADEMIC UNIT
2004

AU	Full Professor		Associate Professor		Assistant Professor		Assistant		Lecturer	Monitors	Others	Total		
	Career	Invited	Career	Invited	Career	Invited	Career	Invited				Career	Invited	Total
FCT	31	4	50	3	223	20	112	34	1	1	9	416	72	**488**
FCSH	34	0	52	2	131	5	30	47	19	0	1	247	74	**321**
FE	13	1	12	6	7	43	21	24	0	0	0	53	74	**127**
FCM	18	1	11	14	13	35	5	210	0	21	1	47	282	**329**
FD	4	0	10	0	2	0	0	6	0	0	0	16	6	**22**
IHMT	3	2	4	0	19	5	4	2	0	0	0	30	9	**39**
ISEGI	2	2	2	2	0	12	7	0	0	9	0	11	25	**36**
ITQB	5	2	2	0	0	5	0	0	0	0	1	7	8	**15**
ENSP	2	0	9	1	2	7	0	16	0	0	0	13	24	**37**
NOVA	**112**	**12**	**152**	**28**	**397**	**132**	**179**	**339**	**20**	**31**	**12**	**840**	**574**	**1 414**

ACADEMIC STAFF (FTE) BY RANK AND ACADEMIC UNIT
2004

AU	Full Professor		Associate Professor		Assistant Professor		Assistant		Lecturer	Monitors	Others	Total		
	Career	Invited	Career	Invited	Career	Invited	Career	Invited				Career	Invited	Total
FCT	30	1,7	49	1,6	215	10,1	110	21,2	1	0,3	9	404	44,9	**448,9**
FCSH	31	0	47	0,8	125	2,8	26	26,1	17,8	0	1	229	48,5	**277,5**
FE	11	1,5	11	2,3	7	31,8	19	17,5	0	0	0	48	53,1	**101,1**
FCM	16	0,3	9	5,2	13	14,4	5	85,4	0	6,3	1	43	112,6	**155,6**
FD	4	0	8	0	2	0	0	5	0	0	0	14	5	**19,0**
IHMT	3	1,5	4	0	19	2,7	4	0,7	0	0	0	30	4,9	**34,9**
ISEGI	2	0,8	2	0,5	0	3,4	4	0	0	2,7	0	8	7,4	**15,4**
ITQB	5	1,5	2	0	0	4,2	0	0	0	0	1	7	6,7	**13,7**
ENSP	2	0	9	1	2	3	0	8,6	0	0	0	13	12,6	**25,6**
NOVA	**104**	**7,3**	**141**	**11,4**	**383**	**72,4**	**168,0**	**164,5**	**18,8**	**9,3**	**12,0**	**796**	**295,7**	**1 091,7**



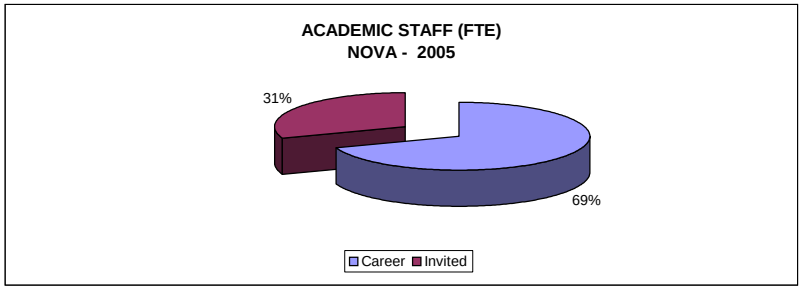
Source: INDEZ/REBIDES

ACADEMIC STAFF BY RANK AND ACADEMIC UNIT
2005

AU	Full Professor		Associate Professor		Assistant Professor		Assistant		Lecturer	Monitors	Others	Total		
	Career	Invited	Career	Invited	Career	Invited	Career	Invited				Career	Invited	Total
FCT	34	4	54	1	239	16	65	66	1	0	9	392	97	**489**
FCSH	31	0	57	2	130	8	21	39	18	0	1	239	68	**307**
FE	10	3	14	4	6	47	12	24	0	1	5	42	84	**126**
FCM	15	2	9	16	16	38	5	251	0	15	0	45	322	**367**
FD	4	0	8	3	5	7	0	4	0	0	0	17	14	**31**
IHMT	3	2	3	1	19	5	3	3	0	0	0	28	11	**39**
ISEGI	2	2	2	3	1	11	6	2	0	5	0	11	23	**34**
ITQB	5	2	2	2	0	3	0	0	0	0	1	7	8	**15**
ENSP	3	0	10	0	5	6	4	14	0	0	0	22	20	**42**
R	0	0	0	0	1	0	0	0	0	0	0	1	0	**1**
NOVA	**107**	**15**	**159**	**32**	**422**	**141**	**116**	**403**	**19**	**21**	**16**	**804**	**647**	**1 451**

ACADEMIC STAFF (FTE) BY RANK AND ACADEMIC UNIT
2005

AU	Full Professor		Associate Professor		Assistant Professor		Assistant		Lecturer	Monitors	Others	Total		
	Career	Invited	Career	Invited	Career	Invited	Career	Invited				Career	Invited	Total
FCT	34	1,8	54	0,3	233	7,2	63	52,3	1	0	9	384	71,6	**455,6**
FCSH	26	0	54	0,8	123	2,9	17	20,4	16,3	0	1	220	41,4	**261,4**
FE	9	1,8	14	2,5	5	36,4	11	17,3	0	0,3	0	39	58,3	**97,3**
FCM	14	0,8	9	6,1	16	16,7	5	103,2	0	4,5	0	44	131,3	**175,3**
FD	3	0	6	1,2	5	2,3	0	3	0	0	0	14	6,5	**20,5**
IHMT	3	1,5	3	0,5	18	3	3	1,7	0	0	0	27	6,7	**33,7**
ISEGI	2	0,8	2	1,3	1	3,1	6	0,7	0	1,5	0	11	7,4	**18,4**
ITQB	5	1,5	2	2	0	2,6	0	0	0	0	1	7	7,1	**14,1**
ENSP	2	0	9	0	4	2	4	4,8	0	0	0	19	6,8	**25,8**
R	0	0	0	0	1	0	0	0	0	0	0	1	0	**1,0**
NOVA	**98**	**8,2**	**153**	**14,7**	**406**	**76,2**	**109,0**	**203,4**	**17,3**	**6,3**	**11,0**	**766**	**337,1**	**1 103,1**



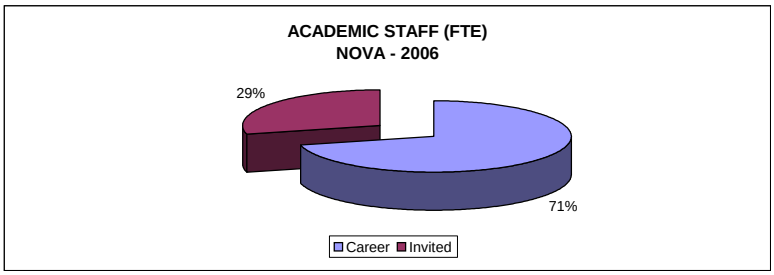
Source: INDEZ/REBIDES

ACADEMIC STAFF BY RANK AND ACADEMIC UNIT
2006

AU	Full Professor		Associate Professor		Assistant Professor		Assistant		Lecturer	Monitors	Others	Total		
	Career	Invited	Career	Invited	Career	Invited	Career	Invited				Career	Invited	Total
FCT	37	2	53	1	270	14	77	32	1	0	8	437	58	**495**
FCSH	26	0	55	0	116	22	8	43	15	3	0	205	83	**288**
FE	13	3	13	5	6	40	15	28	0	0	0	47	76	**123**
FCM	12	3	10	15	14	44	5	247	0	12	0	41	321	**362**
FD	5	0	8	2	7	13	0	2	0	0	0	20	17	**37**
IHMT	4	2	3	0	18	6	3	2	0	0	0	28	10	**38**
ISEGI	2	2	2	4	3	17	4	5	0	1	0	11	29	**40**
ITQB	4	1	4	0	0	1	0	0	0	0	1	8	3	**11**
ENSP	4	0	7	0	4	8	0	17	0	0	0	15	25	**40**
R	0	0	0	0	0	1	0	0	0	0	0	0	1	**1**
NOVA	**107**	**13**	**155**	**27**	**438**	**166**	**112**	**376**	**16**	**16**	**9**	**812**	**623**	**1 435**

ACADEMIC STAFF (FTE) BY RANK AND ACADEMIC UNIT
2006

AU	Full Professor		Associate Professor		Assistant Professor		Assistant		Lecturer	Monitors	Others	Total		
	Career	Invited	Career	Invited	Career	Invited	Career	Invited				Career	Invited	Total
FCT	36	1,3	53	0,3	263	6,8	75	19,1	1	0	8	427	36,5	**463,5**
FCSH	22	0	53	0	108	16,4	5	26	11,3	0,9	0	188	54,6	**242,6**
FE	11	2,5	13	3,3	6	31,1	14	17,6	0	0	0	44	54,5	**98,5**
FCM	11	1,3	10	5,4	14	18,5	5	102,8	0	3,6	0	40	131,6	**171,6**
FD	5	0	6	0,7	7	4,4	0	1	0	0	0	18	6,1	**24,1**
IHMT	4	2	3	0	17	3,5	3	1,2	0	0	0	27	6,7	**33,7**
ISEGI	2	0,5	2	1,6	3	5,0	4	2,3	0	0,3	0	11	9,7	**20,7**
ITQB	4	0,5	4	0	0	1	0	0	0	0	1	8	2,5	**10,5**
ENSP	3	0	6	0	4	2,8	0	9,05	0	0	0	13	11,85	**24,9**
R	0	0	0	0	0	1	0	0	0	0	0	0	1	**1,0**
NOVA	**98**	**8,1**	**150**	**11,3**	**422**	**90,5**	**106,0**	**179,1**	**12,3**	**4,8**	**9,0**	**776**	**315,05**	**1 091,1**



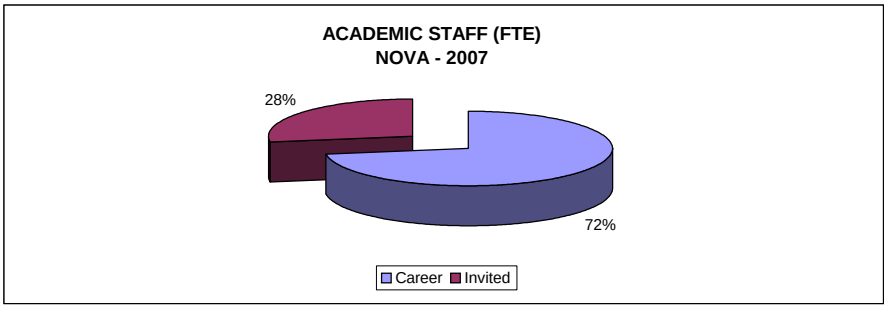
Source: INDEZ/REBIDES

ACADEMIC STAFF BY RANK AND ACADEMIC UNIT
2007

AU	Full Professor		Associate Professor		Assistant Professor		Assistant		Lecturer	Monitors	Others	Total		
	Career	Invited	Career	Invited	Career	Invited	Career	Invited				Career	Invited	Total
FCT	36	2	61	1	293	15	58	46	1	0	5	448	70	**518**
FCSH	24	0	57	0	127	14	12	38	16	3	0	220	71	**291**
FE	13	3	14	4	12	33	13	36	0	1	0	52	77	**129**
FCM	9	5	13	14	15	50	2	247	0	6	1	39	323	**362**
FD	4	0	8	1	7	20	0	3	0	0	0	19	24	**43**
IHMT	4	2	5	0	16	6	3	2	0	0	0	28	10	**38**
ISEGI	2	2	2	2	4	16	2	4	0	0	0	10	24	**34**
ITQB	5	2	3	0	0	1	0	0	0	0	1	8	4	**12**
ENSP	3	0	7	0	5	8	0	14	0	0	0	15	22	**37**
R	0	0	0	0	0	1	0	0	0	0	0	0	1	**1**
NOVA	**100**	**16**	**170**	**22**	**479**	**164**	**90**	**390**	**17**	**10**	**7**	**839**	**626**	**1 465**

ACADEMIC STAFF (FTE) BY RANK AND ACADEMIC UNIT
2007

AU	Full Professor		Associate Professor		Assistant Professor		Assistant		Lecturer	Monitors	Others	Total		
	Career	Invited	Career	Invited	Career	Invited	Career	Invited				Career	Invited	Total
FCT	36	1,3	61	0,3	289	6,4	58	34,6	1	0	4	444	47,6	**491,6**
FCSH	20	0	56	0	117	8,6	9	15,7	7,6	0,9	0	202	32,8	**234,8**
FE	12	2,5	14	2,3	12	24,05	12	23,25	0	0,3	0	50	52,35	**102,4**
FCM	9	2,8	13	6,4	15	20	2	102,9	0	1,8	1	39	134,9	**173,9**
FD	4	0	6	0,5	7	6,85	0	1,2	0	0	0	17	8,55	**25,6**
IHMT	4	2	5	0	15	4,1	3	1,2	0	0	0	27	7,3	**34,3**
ISEGI	2	0,5	2	0,6	4	5,3	2	3,2	0	0	0	10	9,6	**19,6**
ITQB	4	0,7	3	0	0	1	0	0	0	0	1	7	2,7	**9,7**
ENSP	2	0	6	0	5	2,8	0	7,9	0	0	0	13	10,7	**23,7**
R	0	0	0	0	0	1	0		0	0	0	0	1	**1,0**
NOVA	**93**	**9,8**	**166**	**10,05**	**464**	**80,1**	**86,0**	**190,0**	**8,6**	**3,0**	**6,0**	**809**	**307,5**	**1 116,5**

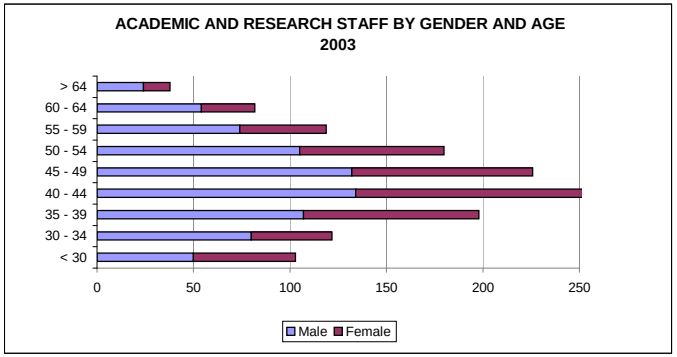


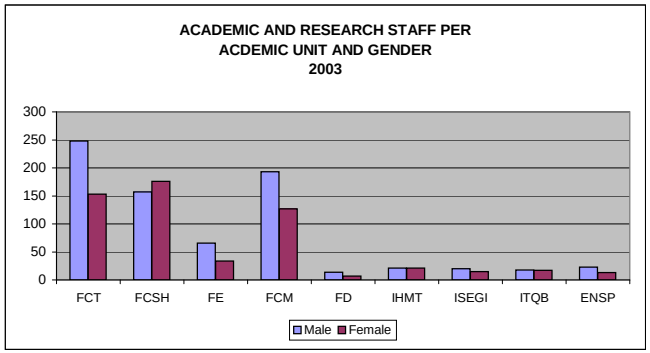
Source: INDEZ/REBIDES

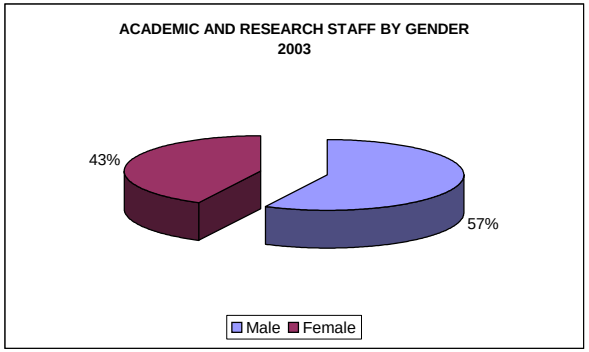
ACADEMIC AND RESEARCH STAFF PER ACADEMIC UNIT BY GENDER AND AGE

2003

	FCT				FCSH				FE				FCM				FD				IHMT				ISEGI				ITQB				ENSP				NOVA			
Age	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**
18 - 24					3	3	50%	**6**	5	2	71%	**7**	2	1	67%	**3**									1	1	50%	**2**									11	7	61%	**18**
25 - 29	15	10	60%	**25**	3	9	25%	**12**	8	12	40%	**20**	9	11	45%	**20**	1	1	50%	**2**					3	2	60%	**5**		1	0%	**1**					39	46	46%	**85**
30 - 34	39	14	74%	**53**	13	6	68%	**19**	11	4	73%	**15**	7	6	54%	**13**	2		100%	**2**	2	3	40%	**5**	3	4	43%	**7**	2	2	50%	**4**	1	3	25%	**4**	80	42	66%	**122**
35 - 39	51	38	57%	**89**	12	18	40%	**30**	9	7	56%	**16**	18	17	51%	**35**	2	2	50%	**4**	4	1	80%	**5**	5	1	83%	**6**	6	6	50%	**12**		1	0%	**1**	107	91	54%	**198**
40 - 44	49	42	54%	**91**	24	29	45%	**53**	10	1	91%	**11**	39	35	53%	**74**					2	4	33%	**6**	4	5	44%	**9**	5	3	63%	**8**	1	2	33%	**3**	134	121	53%	**255**
45 - 49	35	21	63%	**56**	34	32	52%	**66**	10	3	77%	**13**	37	26	59%	**63**	3	1	75%	**4**	6	7	46%	**13**	2		100%	**2**	2	1	67%	**3**	3	3	50%	**6**	132	94	58%	**226**
50 - 54	32	16	67%	**48**	17	29	37%	**46**	8	4	67%	**12**	37	16	70%	**53**	2	2	50%	**4**	1	3	25%	**4**	1	2	33%	**3**		1	0%	**1**	7	2	78%	**9**	105	75	58%	**180**
55 - 59	13	10	57%	**23**	22	21	51%	**43**	4		100%	**4**	26	7	79%	**33**	1	1	50%	**2**	2	2	50%	**4**	1		100%	**1**	1	2	33%	**3**	4	2	67%	**6**	74	45	62%	**119**
60 - 64	11	2	85%	**13**	22	18	55%	**40**		1	0%	**1**	11	5	69%	**16**	2		100%	**2**	3	1	75%	**4**					2	1	67%	**3**	3		100%	**3**	54	28	66%	**82**
65 - 69	3		100%	**3**	7	11	39%	**18**	1		100%	**1**	7	3	70%	**10**	1		100%	**1**	1		100%	**1**									4		100%	**4**	24	14	63%	**38**
Total	248	153	62%	**401**	157	176	47%	**333**	66	34	66%	**100**	193	127	60%	**320**	14	7	67%	**21**	21	21	50%	**42**	20	15	57%	**35**	18	17	51%	**35**	23	13	64%	**36**	760	563	57%	**1323**





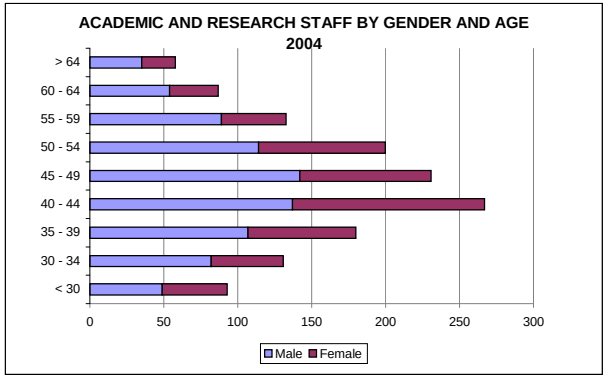


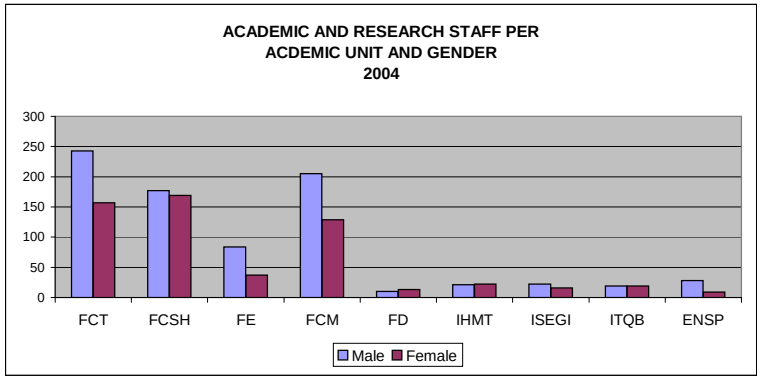
Source: Balanço Social /2003

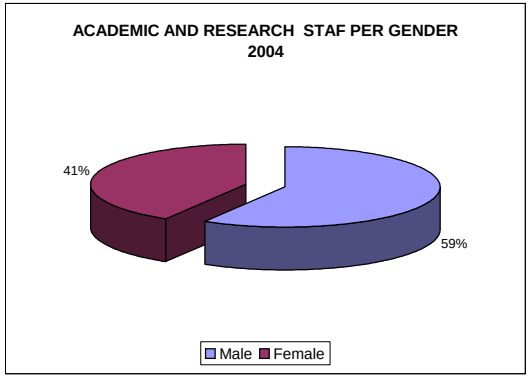
ACADEMIC AND RESEARCH STAFF PER ACADEMIC UNIT BY GENDER AND AGE

2004

	FCT				FCSH				FE				FCM				FD				IHMT				ISEGI				ITQB				ENSP				NOVA			
Age	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**
18 - 24									12	4	75%	**16**	2	2	50%	**4**										2	0%	**2**									14	8	64%	**22**
25 - 29	8	7	53%	**15**	4	7	36%	**11**	6	6	50%	**12**	13	13	50%	**26**									4	3	57%	**7**									35	36	49%	**71**
30 - 34	39	12	76%	**51**	10	12	45%	**22**	16	10	62%	**26**	7	5	58%	**12**	2	2	50%	**4**		1	0%	**1**	4	4	50%	**8**	3	2	60%	**5**	1	1	50%	**2**	82	49	63%	**131**
35 - 39	52	33	61%	**85**	9	10	47%	**19**	14	5	74%	**19**	14	12	54%	**26**	1	2	33%	**3**	6	3	67%	**9**	5		100%	**5**	4	7	36%	**11**	2	1	67%	**3**	107	73	59%	**180**
40 - 44	43	44	49%	**87**	29	32	48%	**61**	9	3	75%	**12**	43	36	54%	**79**	1	1	50%	**2**	2	4	33%	**6**	3	5	38%	**8**	5	4	56%	**9**	2	1	67%	**3**	137	130	51%	**267**
45 - 49	42	28	60%	**70**	36	15	71%	**51**	10	3	77%	**13**	36	30	55%	**66**	1	2	33%	**3**	5	7	42%	**12**	3		100%	**3**	4	2	67%	**6**	5	2	71%	**7**	142	89	61%	**231**
50 - 54	29	17	63%	**46**	22	34	39%	**56**	8	5	62%	**13**	39	18	68%	**57**	3	2	60%	**5**	2	5	29%	**7**	2	2	50%	**4**		1	0%	**1**	9	2	82%	**11**	114	86	57%	**200**
55 - 59	15	12	56%	**27**	29	19	60%	**48**	6		100%	**6**	32	7	82%	**39**		2	0%	**2**	2		100%	**2**	1		100%	**1**	1	2	33%	**3**	3	2	60%	**5**	89	44	67%	**133**
60 - 64	11	4	73%	**15**	24	19	56%	**43**	2	1	67%	**3**	9	6	60%	**15**	1		100%	**1**	1	2	33%	**3**					2	1	67%	**3**	4		100%	**4**	54	33	62%	**87**
65 - 69	4		100%	**4**	14	21	40%	**35**	1		100%	**1**	10		100%	**10**	1	2	33%	**3**	3		100%	**3**									2		100%	**2**	35	23	60%	**58**
Total	243	157	61%	**400**	177	169	51%	**346**	84	37	69%	**121**	205	129	61%	**334**	10	13	43%	**23**	21	22	49%	**43**	22	16	58%	**38**	19	19	50%	**38**	28	9	76%	**37**	809	571	59%	**1380**





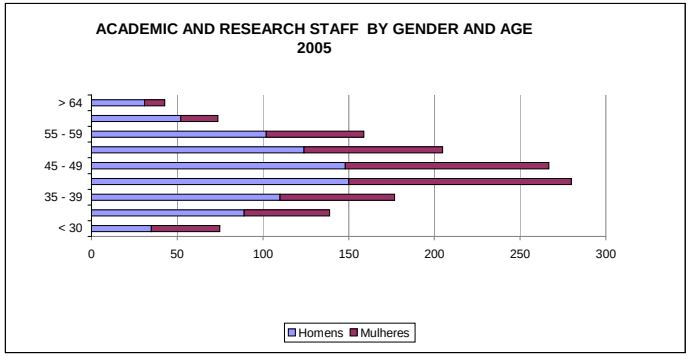


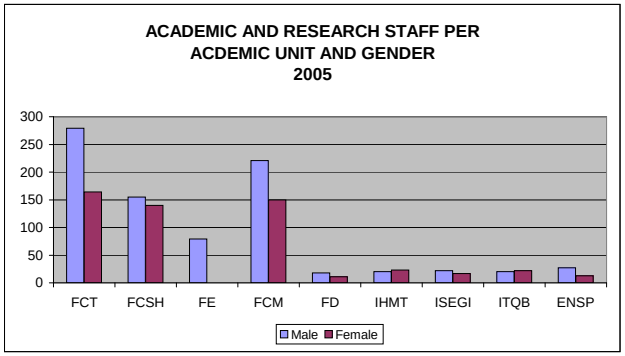
Source: Balanço Social /2004

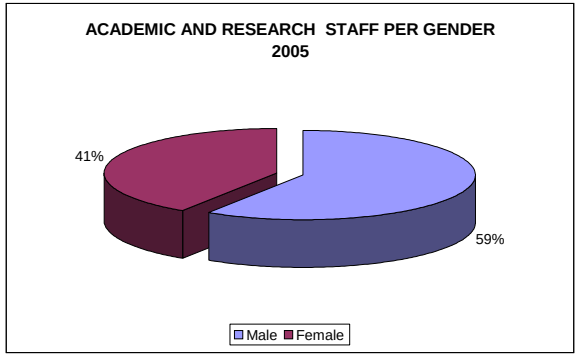
ACADEMIC AND RESEARCH STAFF PER ACADEMIC UNIT BY GENDER AND AGE

2005

	FCT				FCSH				FE				FCM				FD				IHMT				ISEGI				ITQB				ENSP				NOVA			
Age	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**
18 - 24									5	1	83%	**6**	4	3	57%	**7**										1		**1**									9	5	64%	**14**
25 - 29	5	6	45%	**11**	1		100%	**1**	8	9	47%	**17**	8	14	36%	**22**		1	0%	**1**		1	0%	**1**	3	3	50%	**6**					1	1	50%	**2**	26	35	43%	**61**
30 - 34	43	12	78%	**55**	10	4	71%	**14**	15	9	63%	**24**	11	13	46%	**24**	3	3	50%	**6**					4	3		**7**	2	5	29%	**7**	1	1	50%	**2**	89	50	64%	**139**
35 - 39	52	25	68%	**77**	13	12	52%	**25**	14	4	78%	**18**	14	10	58%	**24**	1	2	33%	**3**	6	4	60%	**10**	4	3	57%	**7**	5	5	50%	**10**	1	2	33%	**3**	110	67	62%	**177**
40 - 44	66	49	57%	**115**	22	24	48%	**46**	9	6	60%	**15**	39	34	53%	**73**	2	1	67%	**3**	1	4	20%	**5**	4	4	50%	**8**	5	6	45%	**11**	2	2	50%	**4**	150	130	54%	**280**
45 - 49	46	33	58%	**79**	34	32	52%	**66**	10	2	83%	**12**	37	40	48%	**77**	2	1	67%	**3**	5	6	45%	**11**	3	1	75%	**4**	5	2	71%	**7**	6	2	75%	**8**	148	119	55%	**267**
50 - 54	30	19	61%	**49**	19	26	42%	**45**	8	6	57%	**14**	50	19	72%	**69**	6	1	86%	**7**	2	6	25%	**8**	3	1	75%	**4**					6	3	67%	**9**	124	81	60%	**205**
55 - 59	23	15	61%	**38**	25	21	54%	**46**	7	1	88%	**8**	38	12	76%	**50**	1	2	33%	**3**	2		100%	**2**	1	1	50%	**2**	1	3	25%	**4**	4	2	67%	**6**	102	57	64%	**159**
60 - 64	8	5	62%	**13**	21	11	66%	**32**	3		100%	**3**	12	4	75%	**16**	1		100%	**1**	1	1	50%	**2**					2	1	67%	**3**	4		100%	**4**	52	22	70%	**74**
65 - 69	6		100%	**6**	10	10	50%	**20**					8	1	89%	**9**	2		100%	**2**	3	1	75%	**4**									2		100%	**2**	31	12	72%	**43**
Total	279	164	63%	**443**	155	140	53%	**295**	79	38	68%	**117**	221	150	60%	**371**	18	11	62%	**29**	20	23	47%	**43**	22	17	56%	**39**	20	22	48%	**42**	27	13	68%	**40**	841	578	59%	**1419**





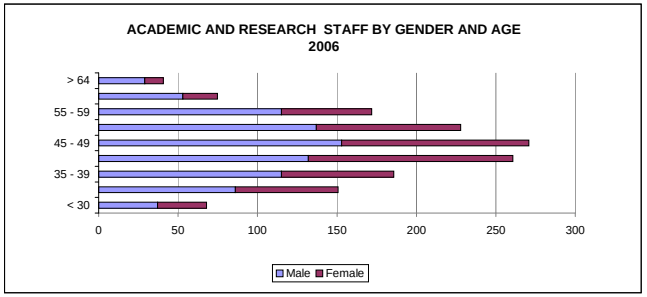


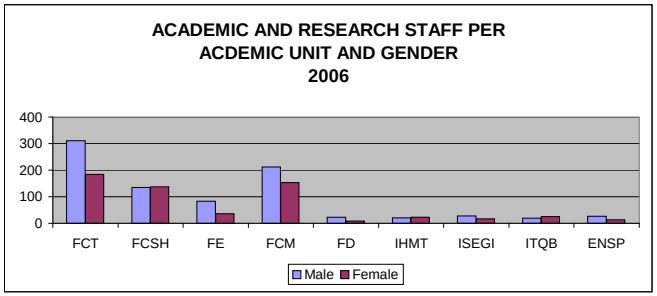
Source: Balanço Social /2005

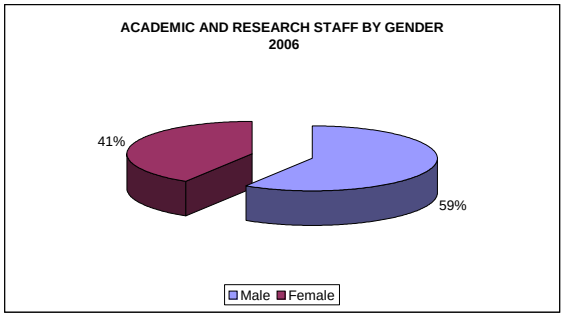
ACADEMIC AND RESEARCH STAFF PER ACADEMIC UNIT BY GENDER AND AGE

2006

	FCT				FCSH				FE				FCM				FD				IHMT				ISEGI				ITQB				ENSP				NOVA			
Age	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**	**M**	**F**	**M/Tot**	**Total**
18 - 24						1	0%	**1**	7	0	100%	**7**	4	1	80%	**5**										1	0%	**1**									11	3	79%	**14**
25 - 29	5	2	71%	**7**	1	2	33%	**3**	8	7	53%	**15**	10	11	48%	**21**						1	0%	**1**	2	4	33%	**6**						1	0%	**1**	26	28	48%	**54**
30 - 34	41	25	62%	**66**	6	5	55%	**11**	13	9	59%	**22**	16	17	48%	**33**	3	3	50%	6		1	0%	**1**	4	2	67%	**6**	2	3	40%	**5**	1		100%	**1**	86	65	57%	**151**
35 - 39	64	29	69%	**93**	9	11	45%	**20**	13	5	72%	**18**	11	10	52%	**21**	1	1	50%	2	3	4	43%	**7**	6	2	75%	**8**	5	8	38%	**13**	3	1	75%	**4**	115	71	62%	**186**
40 - 44	55	47	54%	**102**	19	21	48%	**40**	9	6	60%	**15**	30	35	46%	**65**	2	1	67%	3	4	4	50%	**8**	7	5	58%	**12**	5	7	42%	**12**	1	3	25%	**4**	132	129	51%	**261**
45 - 49	52	32	62%	**84**	34	29	54%	**63**	12	1	92%	**13**	30	44	41%	**74**	5	1	83%	6	4	5	44%	**9**	5	1	83%	**6**	6	3	67%	**9**	5	2	71%	**7**	153	118	56%	**271**
50 - 54	34	26	57%	**60**	22	27	45%	**49**	9	6	60%	**15**	53	22	71%	**75**	5		100%	5	3	6	33%	**9**	3		100%	**3**					8	4	67%	**12**	137	91	60%	**228**
55 - 59	37	13	74%	**50**	19	24	44%	**43**	8	2	80%	**10**	38	9	81%	**47**	3	2	60%	5	3		100%	**3**	1	2	33%	**3**	1	3	25%	**4**	5	2	71%	**7**	115	57	67%	**172**
60 - 64	14	8	64%	**22**	17	10	63%	**27**	4		100%	**4**	13	3	81%	**16**	1		100%	1	1	1	50%	**2**									3		100%	**3**	53	22	71%	**75**
65 - 69	9	2	82%	**11**	8	7	53%	**15**				**0**	7	1	88%	**8**	3		100%	3	2	1	67%	**3**						1	0%	**1**					29	12	71%	**41**
Total	311	184	63%	**495**	135	137	50%	**272**	83	36	70%	**119**	212	153	58%	**365**	23	8	74%	**31**	20	23	47%	**43**	28	17	62%	**45**	19	25	43%	**44**	26	13	67%	**39**	857	596	59%	**1453**





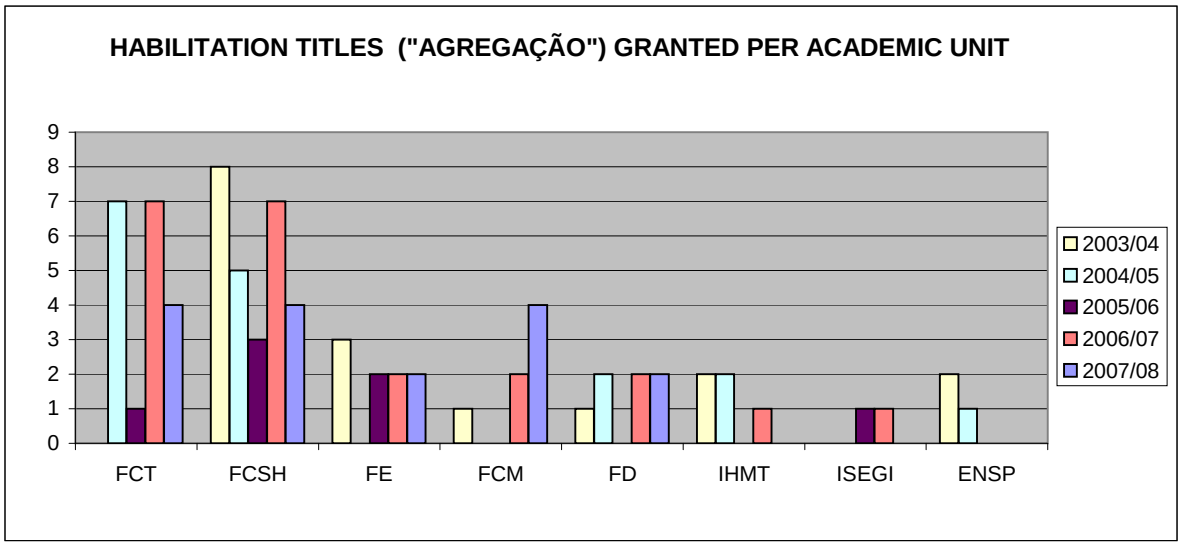


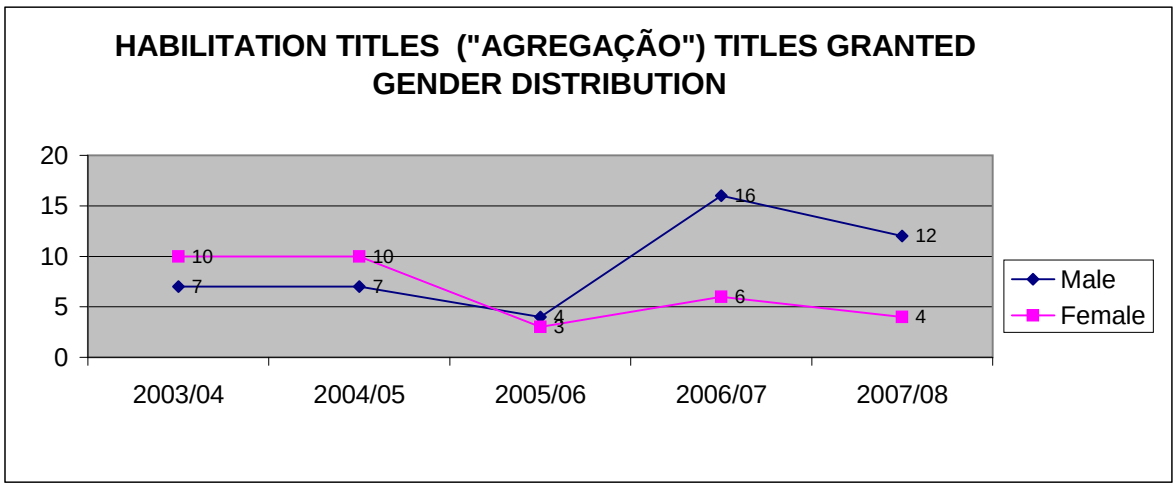
Source: Balanço Social /2006

HABILITATION TITLES ("AGREGAÇÃO")* GRANTED PER ACADEMIC UNIT AND GENDER DISTRIBUTION

AU	2003/04		2004/05		2005/06		2006/07		2007/08	
	Total	M	Total	M	Total	M	Total	M	Total	M
FCT	_		7	57%	1	0%	7	71%	4	75%
FCSH	8	13%	5	0%	3	33%	7	57%	4	100%
FE	3	67%	_		2	100%	2	100%	2	100%
FCM	1	100%	_		_		2	100%	4	50%
FD	1	100%	2	100%	_		2	50%	2	50%
IHMT	2	0%	2	0%	_		1	100%	_	
ISEGI	_		_		1	100%	1	100%	_	
ENSP	2	100%	1	100%	_		_		_	
Total	17	41%	17	41%	7	57%	22	73%	16	75%

(*) Pre-requisite to become Full Professor



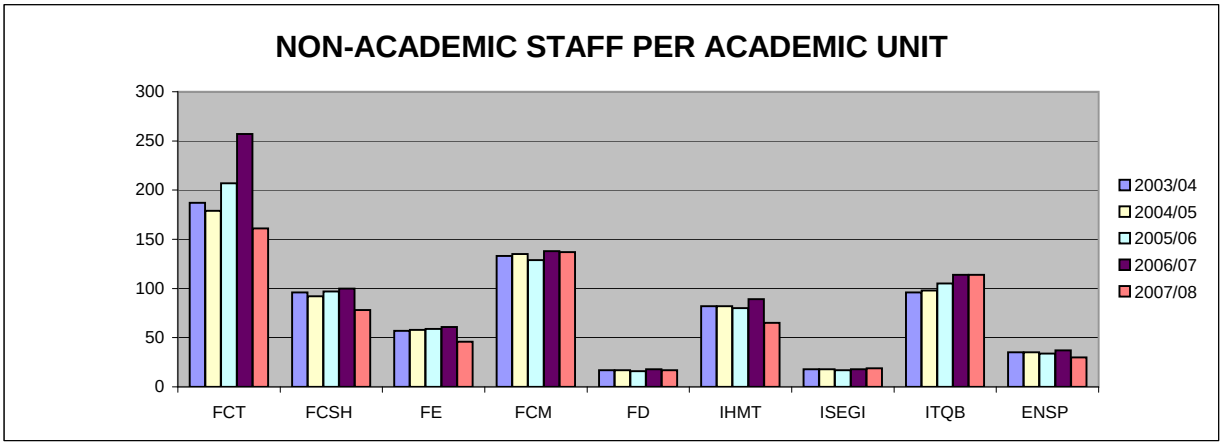


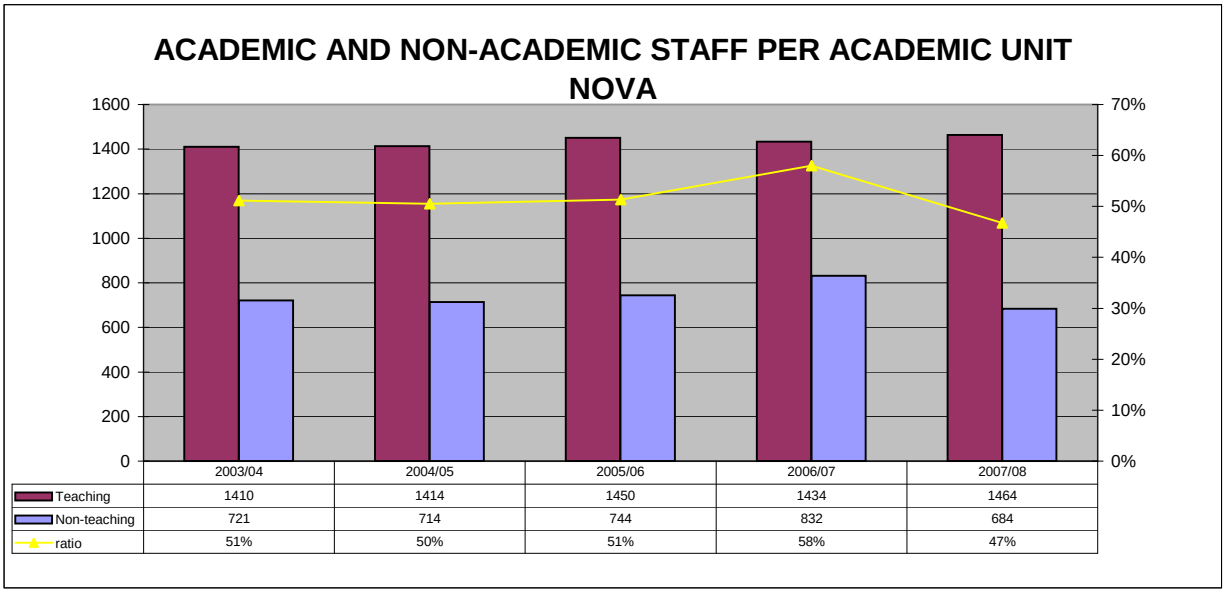
Source: Acad.Serv/R

NON-ACADEMIC STAFF PER ACADEMIC UNIT

(Non-Academic Staff/Academic Staff ratio)

AU		2003/04	2004/05	2005/06	2006/07	2007/08
FCT	NON-TEACHING	187	179	207	257	161
	ratio	39%	37%	42%	52%	31%
FCSH	NON-TEACHING	96	92	97	100	78
	ratio	28%	29%	32%	35%	27%
FE	NON-TEACHING	57	58	59	61	63
	ratio	52%	46%	47%	50%	49%
FCM	NON-TEACHING	133	135	129	138	137
	ratio	42%	41%	35%	38%	38%
FD	NON-TEACHING	17	17	16	18	17
	ratio	89%	77%	52%	49%	40%
IHMT	NON-TEACHING	82	82	80	89	65
	ratio	222%	210%	205%	234%	171%
ISEGI	NON-TEACHING	18	18	17	18	19
	ratio	47%	50%	50%	45%	56%
ITQB	NON-TEACHING	96	98	105	114	114
	ratio	436%	653%	700%	1036%	950%
ENSP	NON-TEACHING	35	35	34	37	30
	ratio	95%	95%	81%	93%	81%
NOVA (s/R)	**NON-TEACHING**	**721**	**714**	**744**	**832**	**684**
	ratio	**51%**	**50%**	**51%**	**58%**	**47%**



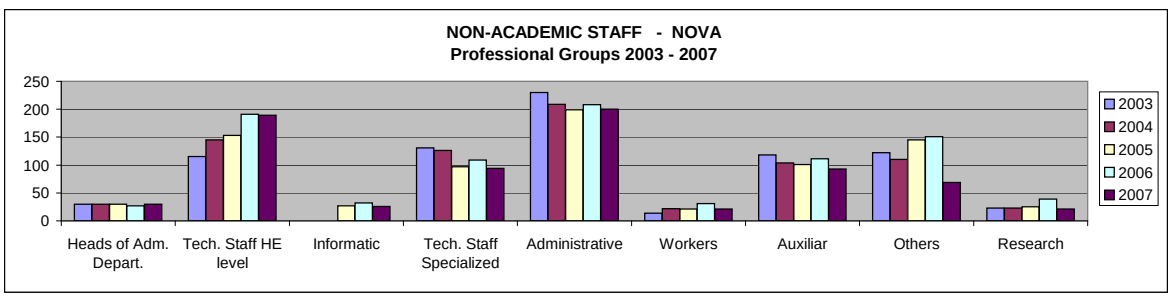


Source: INDEZ

NON-ACADEMIC STAFF PER ACADEMIC UNIT

Professional Groups 2003 - 2007

	AU	Heads of Adm. Depart.	Tech. Staff HE level	Informatic	Tech. Staff Specialized	Administrative	Workers	Auxiliar	Others	Research	TOT
2003	FCT	6	27		43	64	8	32	5	2	187
	FCSH	1	9		13	43		17	12	1	96
	FE	2	6		12	10	2	6	18	1	57
	FCM	4	22		28	49	1	21	2	6	133
	FD		3		2	1			11		17
	IHMT	3	17		7	16	1	20	11	7	82
	ISEGI	1	4						13		18
	ITQB	2	12		6	17		11	43	5	96
	ENSP	2	2		14	8	2	7			35
	R	9	13		6	22		4	7	1	62
	NOVA	**30**	**115**		**131**	**230**	**14**	**118**	**122**	**23**	**783**
2004	FCT		40		37	60	6	30	4	2	179
	FCSH	1	12		11	41		17	9	1	92
	FE	6	11		9	7	3	5	16	1	58
	FCM	5	31		27	43	1	21	1	6	135
	FD		9		2	1		1	4		17
	IHMT	3	11		18	13	1	19	10	7	82
	ISEGI	1	5						12		18
	ITQB	2	16		2	14	9		50	5	98
	ENSP	2	2		14	8	2	7			35
	R	10	8		6	22		4	4	1	55
	NOVA	**30**	**145**		**126**	**209**	**22**	**104**	**110**	**23**	**769**
2005	FCT	2	33	12	28	61	6	29	30	6	207
	FCSH	1	18	2	9	33		16	17	1	97
	FE	5	10	4	9	7	3	5	15	1	59
	FCM	4	27	3	25	38	1	20	6	5	129
	FD	2	8		2	1		1	2		16
	IHMT	3	20		7	12	1	18	12	7	80
	ISEGI	1	5			7		1	3		17
	ITQB		15	4	2	12	9		58	5	105
	ENSP	2	3		11	9	1	7	1		34
	R	10	14	2	4	19		4	1		54
	NOVA	**30**	**153**	**27**	**97**	**199**	**21**	**101**	**145**	**25**	**798**
2006	FCT	2	43	12	34	59	16	32	41	18	257
	FCSH	1	32	2	10	38	0	16		1	100
	FE	5	22	5	10	9	3	5	1	1	61
	FCM	1	29	5	23	41	1	21	14	3	138
	FD	2	9	2	3	1	0	1	0	0	18
	IHMT	3	11	0	8	11	1	18	31	6	89
	ISEGI	1	7	0	0	9	0	1	0	0	18
	ITQB	0	14	4	2	12	9	0	63	10	114
	ENSP	2	2	0	12	9	1	10	1	0	37
	R	10	22	2	7	19	0	7	0	0	67
	NOVA	**27**	**191**	**32**	**109**	**208**	**31**	**111**	**151**	**39**	**899**
2007	FCT	2	31	11	29	55	5	27		1	161
	FCSH	2	20	2	8	31		14		1	78
	FE	5	23	4	11	11	5	3		1	63
	FCM	2	44	4	22	41		22		2	137
	FD	2	9	1	3	1		1		0	17
	IHMT	3	18		5	11	1	15	6	6	65
	ISEGI	1	9			8		1		0	19
	ITQB	1	14	3	2	13	9		62	10	114
	ENSP	2	2		9	11	1	5		0	30
	R	10	19	1	5	18		5	1	0	59
	NOVA	**30**	**189**	**26**	**94**	**200**	**21**	**93**	**69**	**21**	**743**



Source: INDEZ

NUMBER OF PROGRAMMES PER ACADEMIC UNIT
(Pre-Bologna)

AU	2003/04					2004/05					2005/06				
	Undergraduate Programmes (Licenciatura)	Specialisation (awards a diploma not a degree)	Master (Mestrado)	Doctorate		Undergraduate Programmes (Licenciatura)	Specialisation (awards a diploma not a degree)	Master (Mestrado)	Doctorate		Undergraduate Programmes (Licenciatura)	Specialisation (awards a diploma not a degree)	Master (Mestrado)	Doctorate	
				Programmes	Scientific Areas				Programmes	Scientific Areas				Programmes	Scientific Areas
FCT	17	5	16	n.a.	25	18	3	16		25	20	7	20	n.a.	22
FCSH	25	8	28	n.a.	17	25	9	35		17	25	12	30	n.a.	17
FE	2		2	2	2	2		2	2	2	2		2	2	2
FCM	1		4	n.a.	2	1		4		2	1		1	n.a.	2
FD	1	1	1	1	1	1		1	1	1	1		1	1	8
IHMT		2	1	n.a.	3		3	2		3		1	1	n.a.	3
ISEGI	2		2	1	2	2		2	1	2	2	1	2	1	2
ITQB				n.a.	4					4				n.a.	4
ENSP		3	1	n.a.	1		3	1		1		3	2	n.a.	1
ISPA				n.a.	1					1				n.a.	1
Total	**48**	**19**	**55**	**4**	**58**	**49**	**18**	**63**	**4**	**58**	**51**	**24**	**59**	**4**	**62**

Source: DIMAS

NUMBER OF PROGRAMMES PER ACADEMIC UNIT
1st, 2nd and 3rd Cycle

AU	2006/07									2007/08								
	1st Cycle Licenciatura	1st and 2nd Cycle Mestrado Integrado	Undergraduate Programmes Pré-Bologna Licenciatura	2nd Cycle Mestrado	Graduate Programmes Pré-Bologna Mestrado	Specialized Programmes Diploma	3rd Cycle Doutoramento	Doctoral Studies Pré-Bologna Doutoramento (*)	Doctoral Studies Pré-Bologna Doutoramento Scientific Areas	1st Cycle Licenciatura	1st and 2nd Cycle Mestrado Integrado	Undergraduate Programmes Pré-Bologna Licenciatura	2nd Cycle Mestrado	Graduate Programmes Pré-Bologna Mestrado	Specialized Programmes Diploma	3rd Cycle Doutoramento	Doctoral Studies Pré-Bologna Doutoramento Programmes (*)	Doctoral Studies Pré-Bologna Doutoramento Scientific Areas
FCT	8	5	6	6	18	4	0		24	8	5	6	18	17	6	2		25
FCSH	14	0	0	0	31	2	0		19	14	0	0	34	24	3	0		22
FE	2	0	0	3	2	0	0	2	2	2	0	0	3	2	0	1	1	1
FCM	0	0	1	0	6	0	0		29	0	1	0	0	7	0	0		24
FD	0	0	1	0	1	1	0	1	9	1	0	0	1	2	1	0	1	9
IHMT	0	0	0	1	3	2	0		3	0	0	0	3	2	1	0		3
ISEGI	1	0	1	3	0	0	0	2	2	1	0	1	4	0	0	2	2	2
ITQB	0	0	0	1	0	0	0		4	0	0	0	0	0	0	1	4	4
ENSP	0	0	0	1	2	3	0		1	0	0	0	2	0	3	0		1
NOVA	**25**	**5**	**9**	**15**		**12**	**0**		**93**	**26**	**6**	**7**	**65**		**14**	**6**	**8**	**91**

(*) Doctoral Studies including course units

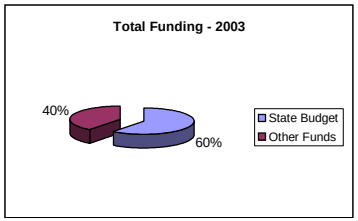
Source: DIMAS

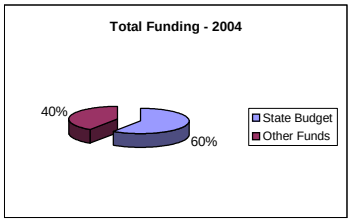
BUDGET - NOVA 2003 - 2007
FUNDING

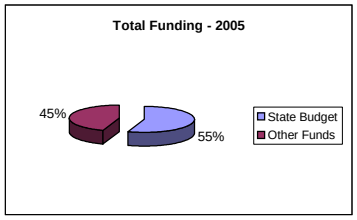
State Budget and Other Funds 2003 - 2007

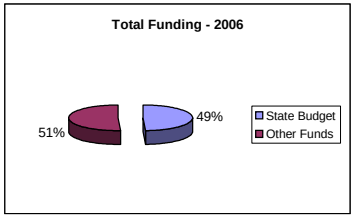
(Euros)

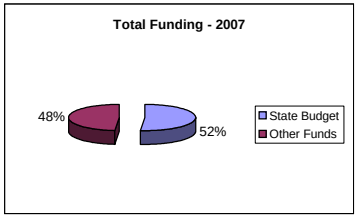
AU	2003			2004			2005			2006			2007		
	Total Funding			Total Funding			Total Funding			Total Funding			Total Funding		
	State Budget	Other Funds	Total	State Budget	Other Funds	Total	State Budget	Other Funds	Total	State Budget	Other Funds	Total	State Budget	Other Funds	Total
FCT	26.043.298	16.967.079	43.010.377	*26.275.068*	13.564.597	39.839.665	27.130.704	21.445.986	48.576.690	25.792.961	24.232.431	50.025.392	25.530.221	23.277.053	48.807.274
FCSH	13.516.116	6.839.342	20.355.458	12.700.943	6.863.158	19.564.101	12.199.519	6.944.271	19.143.790	12.064.142	8.099.288	20.163.430	12.891.452	8.585.323	21.476.775
FE	4.345.890	3.830.389	8.176.279	4.348.665	6.290.933	10.639.598	4.338.000	5.699.098	10.037.098	4.267.586	6.095.337	10.362.923	4.163.183	5.988.067	10.151.250
FCM	8.317.283	3.815.622	12.132.905	8.856.420	4.529.142	13.385.562	9.083.003	4.666.225	13.749.228	8.392.500	5.729.243	14.121.743	8.316.980	5.240.586	13.557.566
FD	1.492.755	786.574	2.279.329	1.404.723	770.679	2.175.402	1.352.022	1.102.169	2.454.191	1.292.607	1.492.126	2.784.733	1.287.268	1.245.738	2.533.006
IHMT	3.945.880	2.030.453	5.976.333	3.908.302	2.410.470	6.318.772	4.135.893	3.090.975	7.226.868	4.026.321	3.488.548	7.514.869	4.210.200	4.576.974	8.787.174
ISEGI	1.330.168	2.362.778	3.692.946	1.273.548	2.359.063	3.632.611	1.353.000	2.537.548	3.890.548	1.259.099	2.438.942	3.698.041	1.220.013	2.187.812	3.407.825
ITQB	3.583.003	3.998.450	7.581.453	3.635.311	4.418.940	8.054.251	3.813.330	5.015.328	8.828.658	3.810.611	11.661.610	15.472.221	3.998.398	6.858.095	10.856.493
ENSP	1.774.034	3.002.825	4.776.859	1.617.694	2.098.698	3.716.392	1.992.853	1.288.011	3.280.864	1.698.034	1.978.590	3.676.624	1.739.253	2.766.094	4.505.347
R	5.386.626	2.332.243	7.718.869	3.951.822	2.892.204	6.844.026	4.685.083	4.644.904	9.329.987	4.522.378	4.053.664	8.576.042	4.681.746	3.303.490	7.985.236
Total	69.735.053	45.965.754	115.700.807	67.972.496	46.197.883	114.170.379	70.083.407	56.434.515	126.517.922	67.126.239	69.269.780	136.396.019	68.038.714	64.029.232	132.067.945











Source: Conta de Gerência

BUDGET - NOVA 2003

FUNDING

(€)

			NOVA		FCT		FCSH		FE		FCM		FD		IHMT		ISEGI		ITQB		ENSP		R	
			Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total
	Total Funding (running expenses)		**117.333.272**		**43.010.377**		**20.355.458**		**9.808.744**		**12.132.905**		**2.279.329**		**5.976.333**		**3.692.946**		**7.581.453**		**4.776.859**		**7.718.869**	
1.	**Government Funding (OE)**	(a)	**69.733.808**	**59%**	**26.043.298**	**61%**	**13.516.116**	**66%**	**4.344.645**	44%	**8.317.283**	69%	**1.492.755**	65%	**3.945.880**	66%	**1.330.168**	36%	**3.583.003**	47%	**1.774.034**	37%	**5.386.626**	70%
2.	**EU Funding**		**2.451.777**	**2%**	**282.481**	**1%**	**158.066**	**1%**	**51.497**	**0,5%**	**96.345**	**0,8%**	**0**	**0,0%**	**45.162**	**0,8%**	**75.427**	**2,0%**	**820.817**	**10,8%**	**514.910**	**10,8%**	407.072	**5,3%**
3.	**Own Revenues**		**35.924.068**	**31%**	**12.422.457**	**29%**	**5.903.425**	**29%**	**5.034.231**	**51%**	**3.578.445**	**29%**	**746.063**	**33%**	**1.504.881**	**25%**	**2.278.942**	**62%**	**450.895**	**6%**	**2.331.623**	**49%**	**1.673.106**	**22%**
3.1.	Tuition Fees	(b)	9.489.161	8,1%	3.770.433	8,8%	2.720.889	13,4%	1.643.691	16,8%	477.534	3,9%	254.899	11,2%	114.562	1,9%	501.252	13,6%	0	0%	5.900	0,1%	0	0%
3.2.	Sales of Services and Goods	(c)	12.841.659	11%	5.155.148	12%	970.965	5%	1.407.705	14%	1.108.786	9%	225.683	10%	215.405	4%	1.368.320	37%	348.113	5%	906.186	19%	1.135.348	15%
3.3.	Interests		216.322	0,18%	50.385	0,12%	27.092	0,1%	29.703	0,30%	20.207	0,17%	4.436	0,19%	11.488	0,19%	1.113	0,03%	3.937	0,05%	23.250	0,49%	44.711	0,58%
3.4.	Private Donations	(d)	973.627	0,83%	180.070	0,42%	130.343	0,64%	254.882	2,60%	53.505	0,44%	10.852	0,48%	154.875	2,59%	0	0%	96.028	1,27%	93.072	2%	0	0%
3.5.	Others Revenues and Balance from 2002		12.403.299	11%	3.266.421	8%	2.054.136	10%	1.698.250	17%	1.918.412	16%	250.193	11%	1.008.551	17%	408.257	11%	2.817	0%	1.303.215	27%	493.047	6%
4.	**Other sources**		**8.072.012**	**7%**	**3.289.923**	**8%**	**773.571**	**4%**	**349.995**	**4%**	**140.832**	**1%**	**28.011**	**1%**	**424.831**	**7%**	**8.409**	**0%**	**2.698.255**	**36%**	**111.480**	**2%**	**246.705**	**3%**
4.1.	FCT Research Funding		4.755.482	4%	1.149.753	3%	563.078	3%	184.687	2%	53.007	0,4%	0	0%	374.514	6%	8.180	0%	2.353.939	31%	3.000	0,1%	65.324	1%
4.2.	NOVA Funding		969.775	0,83%	313.807	0,73%	42.271	0,21%	150.224	1,53%	87.825	0,72%	3.645	0,16%	50.000	0,84%	229	0,01%	68.993	0,91%	100.000	2,09%	152.782	1,98%
4.3.	Funding from Higher Education Institutions		343.127	0,29%	26.363	0,06%	168.222	0,83%	15.084	0,15%	0	0%	24.366	1%	317	0,01%	0	0%	71.696	0,95%	8.480	0,2%	28.599	0,37%
4.5.	Others Revenues and Balance from 2002		2.003.627	2%	1.800.000	4%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	203.627	3%	0	0%	0	0%
5.	**Funding from other Sectors**		**1.151.608**	**1%**	**972.218**	**2%**	**4.280**	**0,02%**	**28.376**	**0%**	**0**	**0%**	**12.500**	**1%**	**55.579**	**1%**	**0**	**0%**	**28.483**	**0%**	**44.812**	**1%**	**5.360**	**0%**
6.	**Government Funding (PIDDAC)**	(e)	**7.370.087**	**6%**					**1.245**	0,01%	**235.226**	2%											**7.133.616**	48%
	Total Funding (running and investment expenses)		**124.703.359**		**43.010.377**		**20.355.458**		**9.809.989**		**12.368.131**		**2.279.329**		**5.976.333**	**0**	**3.692.946**		**7.581.453**		**4.776.859**		**14.852.485**	

Obs:
(a) State Current Budget, Supplementary State Funding and Balance (OE)
(b) Total Tuition Fees assessed against students for educational purposes
(c) Taxes and sales of services and goods
(d) Amounts received from individuals or nongovernmental organizations
(e) State Investments Plan for Central Administration Devellopment Expenses; % on Total Funding (running and investment expenses)

Source: Conta de Gerência

BUDGET - NOVA 2004
FUNDING

(€)

			NOVA		FCT		FCSH		FE		FCM		FD		IHMT		ISEGI		ITQB		ENSP		R	
			Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total
	Total Funding (running expenses)		**114.170.379**		**39.839.665**		**19.564.101**		**10.639.598**		**13.385.562**		**2.175.402**		**6.318.772**		**3.632.611**		**8.054.251**		**3.716.392**		**6.844.026**	
1.	**Government Funding (OE)**	(a)	**67.972.496**	**60%**	***26.275.068***	**66%**	**12.700.943**	**65%**	**4.348.665**	41%	**8.856.420**	66%	**1.404.723**	65%	**3.908.302**	62%	**1.273.548**	35%	**3.635.311**	45%	**1.617.694**	44%	**3.951.822**	58%
2.	**EU Funding**		**2.491.999**	**2%**	**510.919**	**1%**	**145.760**	**1%**	**34.907**	**0,3%**	**89.946**	**0,7%**	**0**	**0,0%**	**428.984**	**6,8%**	**0**	**0,0%**	**764.827**	**9,5%**	**32.196**	**0,9%**	484.460	**7,1%**
3.	**Own Revenues**		**34.505.625**	**30%**	***9.314.027***	**23%**	**5.413.687**	**28%**	**5.626.431**	**53%**	**4.059.116**	**30%**	**709.572**	**33%**	**1.322.119**	**21%**	**2.341.642**	**64%**	**1.581.776**	**20%**	**1.959.453**	**53%**	**2.177.802**	**32%**
3.1.	Tuition Fees	(b)	6.729.783	5,9%		0,0%	2.553.401	13,1%	1.830.882	17,2%	866.185	6,5%	320.314	14,7%	88.896	1,4%	643.351	17,7%	0	0,0%	426.755	11,5%	0	0,0%
3.2.	Sales of Services and Goods	(c)	5.777.303	5%		0%	1.016.363	5%	1.947.561	18%	800.825	6%	129.293	6%	383.877	6%	1.116.403	31%	106.394	1%	101.209	3%	175.378	3%
3.3.	Interests		132.652	0,1%		0,00%	19.020	0,1%	18.544	0,17%	22.107	0,17%	3.529	0,16%	8.417	0,13%	827	0,02%	1.409	0,02%	12.491	0,34%	46.309	0,68%
3.4.	Private Donations	(d)	2.255.098	2,0%		0,00%	56.432	0,29%	195.733	1,84%	49.840	0,37%	5.000	0,23%	415.168	6,57%	0	0%	1.392.924	17,29%	90.000	2%	50.000	0,73%
3.5.	Others Revenues and Balance from 2003		10.294.170	9%		0%	1.768.471	9%	1.633.710	15%	2.317.567	17%	251.436	12%	425.761	7%	581.061	16%	81.049	1%	1.328.998	36%	1.906.115	28%
4.	**Other sources**		**7.860.953**	**7%**	**2.878.791**	**7%**	**1.171.747**	**6%**	**619.180**	**6%**	**360.108**	**3%**	**61.107**	**3%**	**486.893**	**8%**	**17.421**	**0%**	**2.030.896**	**25%**	**7.250**	**0%**	**227.561**	**3%**
4.1.	FCT Research Funding		4.289.798	4%		0%	1.112.792	6%	611.082	6%	112.856	1%	30.648	1%	267.485	4%	17.319	0,5%	1.957.508	24%	7.250	0,2%	172.858	3%
4.2.	NOVA Funding		278.135	0,24%		0,00%	12.681	0,06%	1.233	0,01%	128.641	0,96%	30.459	1,40%	0	0,00%	102	0,00%	59.000	0,73%	0	0,00%	46.019	0,67%
4.3.	Funding from Higher Education Institutions		135.420	0,12%		0,00%	46.274	0,24%	6.865	0%	16.100	0,12%	0	0%	43.110	0,68%	0	0%	14.388	0,18%	0	0%	8.683	0,13%
4.5.	Others Revenues and Balance from 2003		278.808	0,2%		0%	0	0%	0	0%	102.511	1%	0	0%	176.297	3%	0	0%	0	0%	0	0%	0	0%
5.	**Funding from other Sectors**		**1.339.306**	**1%**	**860.860**	**2%**	**131.964**	**1%**	**10.415**	**0%**	**19.972**	**0%**	**0**	**0%**	**172.474**	**3%**	**0**	**0%**	**41.441**	**1%**	**99.799**	**3%**	**2.381**	**0%**
6.	**Government Funding (PIDDAC)**	(e)	**6.457.381**	**5%**							**31.149**	0,2%											**6.426.232**	48%
	Total Funding (running and investment expenses)		**120.627.760**		**39.839.665**		**19.564.101**		**10.639.598**		**13.416.711**		**2.175.402**		**6.318.772**	**0**	**3.632.611**		**8.054.251**		**3.716.392**		**13.270.258**	

Obs: **(a)** State Current Budget, Supplementary State Funding and Balance (OE)
(b) Total Tuition Fees assessed against students for educational purposes
(c) Taxes and sales of services and goods
(d) Amounts received from individuals or nongovernmental organizations
(e) State Investments Plan for Central Administration Devellopment Expenses; % on Total Funding (running and investment expenses)

Source: Conta de Gerência

BUDGET - NOVA 2005
FUNDING

(€)

			NOVA		FCT		FCSH		FE		FCM		FD		IHMT		ISEGI		ITQB		ENSP		R	
			Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total
	Total Funding (running expenses)		**126.517.922**		**48.576.690**		**19.143.790**		**10.037.098**		**13.749.228**		**2.454.191**		**7.226.868**		**3.890.548**		**8.828.658**		**3.280.864**		**9.329.987**	
1.	**Government Funding (OE)**	(a)	**70.083.407**	**55%**	**27.130.704**	**56%**	**12.199.519**	**64%**	**4.338.000**	43%	**9.083.003**	66%	**1.352.022**	55%	**4.135.893**	57%	**1.353.000**	35%	**3.813.330**	43%	**1.992.853**	61%	**4.685.083**	50%
2.	**EU Funding**		**2.715.820**	**2%**	**720.872**	**1%**	**309.018**	**2%**	**54.014**	**0,5%**	**30.734**	**0,2%**	**0**	**0,0%**	**621.702**	**8,6%**	**71.772**	**1,8%**	**189.055**	**2,1%**	**15.182**	**0,5%**	703.471	**7,5%**
3.	**Own Revenues**		**36.683.631**	**29%**	**12.289.759**	**25%**	**4.838.691**	**25%**	**5.286.343**	**53%**	**4.485.524**	**33%**	**961.806**	**39%**	**1.731.236**	**24%**	**2.443.630**	**63%**	**792.937**	**9%**	**1.216.801**	**37%**	**2.636.904**	**28%**
3.1.	Tuition Fees	(b)	12.405.453	9,8%	4.847.088	10,0%	2.649.202	13,8%	1.933.168	19,3%	1.053.303	7,7%	472.960	19,3%	39.695	0,5%	641.522	16,5%	64.050	0,7%	277.300	8,5%	427.165	4,6%
3.2.	Sales of Services and Goods	(c)	11.105.745	9%	3.627.928	7%	1.118.823	6%	1.305.333	13%	1.073.949	8%	114.855	5%	1.454.868	20%	*1.346.242*	35%	132.395	1%	196.063	6%	735.289	8%
3.3.	Interests		164.126	0,13%	68.178	0,14%	0	0%	15.874	0,16%	15.700	0,11%	4.307	0,18%	15.462	0,21%	813	0,02%	3.860	0,04%	8.338	0,25%	31.593	0,34%
3.4.	Private Donations	(d)	1.417.731	1,12%	12.230	0,03%	64.051	0,33%	443.512	4,42%	145.206	1,06%	115.716	4,72%	221.211	3,06%	0	0%	360.806	4,09%	0	0%	55.000	0,59%
3.5.	Others Revenues and Balance from 2004		11.590.575	9%	3.734.335	8%	1.006.615	5%	1.588.456	16%	2.197.365	16%	253.968	10%	0	0%	455.053	12%	231.826	3%	735.100	22%	1.387.857	15%
4.	**Other sources**		**15.860.535**	**13%**	**7.636.335**	**16%**	**1.689.442**	**9%**	**322.713**	**3%**	**145.104**	**1%**	**140.363**	**6%**	**590.209**	**8%**	**22.146**	**1%**	**4.008.943**	**45%**	**750**	**0,02%**	**1.304.529**	**14%**
4.1.	FCT Research Funding		10.293.438	8%	4.128.630	8%	1.398.863	7%	321.078	3%	78.135	1%	107.384	4%	361.009	5%	0	0%	3.898.338	44%	0	0%	0	0%
4.2.	NOVA Funding		1.143.025	0,90%	238.661	0,49%	74.923	0,39%	1.635	0,02%	49.214	0,36%	32.979	1,34%	62.372	0,86%	22.146	0,57%	92.601	1,05%	500	0,02%	567.994	6,09%
4.3.	Funding from Higher Education Institutions		1.006.887	0,80%	15.909	0,03%	51.856	0,27%	0	0%	17.755	0,13%	0	0%	166.828	2,31%	0	0%	18.004	0,20%	0	0%	736.535	7,89%
4.5.	Others Revenues and Balance from 2004		3.417.185	3%	3.253.135	7%	163.800	1%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	250	0%	0	0%
5.	**Funding from other Sectors**		**1.174.530**	**1%**	**799.020**	**2%**	**107.120**	**1%**	**36.027**	**0,4%**	**4.863**	**0,04%**	**0**	**0%**	**147.828**	**2%**	**0**	**0%**	**24.393**	**0%**	**55.278**	**2%**	**0**	**0%**
6.	**Government Funding (PIDDAC)**	(e)	**7.492.657**	**6%**							**425.590**	3,0%											**7.067.067**	43%
	Total Funding (running and investment expenses)		**134.010.579**		**48.576.690**		**19.143.790**		**10.037.098**		**14.174.818**		**2.454.191**		**7.226.868**	**0**	**3.890.548**		**8.828.658**		**3.280.864**		**16.397.054**	

Obs: **(a)** State Current Budget, Supplementary State Funding and Balance (OE)
(b) Total Tuition Fees assessed against students for educational purposes
(c) Taxes and sales of services and goods
(d) Amounts received from individuals or nongovernmental organizations
(e) State Investments Plan for Central Administration Devellopment Expenses; % on Total Funding (running and investment expenses)

Source: Conta de Gerência

BUDGET - NOVA 2006
FUNDING

(€)

			NOVA		FCT		FCSH		FE		FCM		FD		IHMT		ISEGI		ITQB		ENSP		R	
			Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total
	Total Funding (running expenses)		**136.396.019**		**50.025.392**		**20.163.430**		**10.362.923**		**14.121.743**		**2.784.733**		**7.514.869**		**3.698.041**		**15.472.221**		**3.676.624**		**8.576.042**	
1.	**Government Funding (OE)**	(a)	**67.126.239**	**49%**	**25.792.961**	**52%**	**12.064.142**	**60%**	**4.267.586**	41%	**8.392.500**	59%	**1.292.607**	46%	**4.026.321**	54%	**1.259.099**	34%	**3.810.611**	25%	**1.698.034**	46%	**4.522.378**	53%
2.	**EU Funding**		**7.658.201**	**6%**	**2.998.768**	**6%**	**630.592**	**3%**	**72.652**	**0,7%**	**88.019**	**0,6%**	**85.437**	**3,1%**	**555.902**	**7,4%**	**122.397**	**3,3%**	**2.212.120**	**14,3%**	**36.609**	**1,0%**	855.703	**10,0%**
3.	**Own Revenues**		**30.070.220**	**22%**	**10.731.894**	**21%**	**5.421.767**	**27%**	**3.629.706**	**35%**	**3.730.339**	**26%**	**1.017.884**	**37%**	**911.219**	**12%**	**1.530.203**	**41%**	**632.044**	**4%**	**1.250.100**	**34%**	**1.215.064**	**14%**
3.1.	Tuition Fees	(b)	13.866.652	10,2%	5.218.317	10,4%	3.189.771	15,8%	2.149.000	20,7%	1.149.904	8,1%	851.147	30,6%	120.503	1,6%	743.420	20,1%	45.000	0,3%	395.670	10,8%	3.920	0,05%
3.2.	Sales of Services and Goods	(c)	12.292.331	9%	4.469.426	9%	2.143.360	11%	1.120.390	11%	2.133.456	15%	119.775	4%	447.342	6%	784.879	21%	85.425	1%	631.234	17%	357.044	4%
3.3.	Interests		345.934	0,25%	162.450	0,32%		0%	16.404	0,16%	25.992	0,18%	4.324	0,16%	28.445	0,38%	1.225	0,03%	19.258	0,12%	3.761	0,10%	84.075	0,98%
3.4.	Private Donations	(d)	1.504.066	1,10%	125.316	0,25%	42.707	0,21%	343.912	3,32%	33.005	0,23%	38.158	1,37%	273.607	3,64%		0%	482.360	3,12%	62.500	2%	102.500	1,20%
3.5.	Others Revenues and Balance from 2005		2.061.238	2%	756.384	2%	45.929	0,2%	0	0%	387.982	3%	4.480	0,2%	41.323	1%	679	0%	0	0%	156.936	4%	667.525	8%
4.	**Other sources**		**30.991.037**	**23%**	**10.104.233**	**20%**	**2.011.928**	**10%**	**2.372.397**	**23%**	**1.910.884**	**14%**	**388.805**	**14%**	**1.975.223**	**26%**	**786.342**	**21%**	**8.817.447**	**57%**	**670.881**	**18%**	**1.952.896**	**23%**
4.1.	FCT Research Funding		13.845.465	10%	3.450.176	7%	1.464.095	7%	374.029	4%	107.242	0,8%	40.333	1%		0%		0%	8.409.590	54%		0%		0%
4.2.	NOVA Funding		234.969	0,17%	494	0,001%	94.962	0,47%	280	0,003%	96.109	0,68%	22.157	0,80%		0%		0%	722	0,00%		0%	20.245	0,24%
4.3.	Funding from Higher Education Institutions		1.231.492	0,90%		0,0%	28.213	0,14%	1.877	0,02%	38.484	0,27%		0%	610.416	8%		0%	171.332	1,11%		0%	381.170	4,44%
4.5.	Others Revenues and Balance from 2005		15.679.111	11%	6.653.564	13%	424.658	2%	1.996.211	19%	1.669.050	12%	326.315	12%	1.364.807	18%	786.342	21%	235.802	2%	670.881	18%	1.551.481	18%
5.	**Funding from other Sectors**		**550.321**	**0%**	**397.536**	**1%**	**35.000**	**0,2%**	**20.582**	**0,2%**		**0%**		**0%**	**46.203**	**1%**		**0%**		**0%**	**21.000**	**1%**	**30.000**	**0%**
6.	**Government Funding (PIDDAC)**	(e)	**3.203.154**	**2%**							**501.066**	3,4%											**2.702.088**	24%
	Total Funding (running and investment expenses)		**139.599.173**		**50.025.392**		**20.163.430**		**10.362.923**		**14.622.809**		**2.784.733**		**7.514.869**	**0**	**3.698.041**		**15.472.221**		**3.676.624**		**11.278.130**	

Obs: **(a)** State Current Budget, Supplementary State Funding and Balance (OE)
(b) Total Tuition Fees assessed against students for educational purposes
(c) Taxes and sales of services and goods
(d) Amounts received from individuals or nongovernmental organizations
(e) State Investments Plan for Central Administration Devellopment Expenses; % on Total Funding (running and investment expenses)

Source: Conta de Gerência

BUDGET - NOVA 2007
FUNDING

(€)

			NOVA		FCT		FCSH		FE		FCM		FD		IHMT		ISEGI		ITQB		ENSP		R	
			Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total	Total	% on Total
	Total Funding (running expenses)		**132.067.945**		**48.807.274**		**21.476.775**		**10.151.250**		**13.557.566**		**2.533.006**		**8.787.174**		**3.407.825**		**10.856.493**		**4.505.347**		**7.985.236**	
1.	**Government Funding (OE)**	(a)	**68.038.714**	**51,518%**	**25.530.221**	**52%**	**12.891.452**	**60%**	**4.163.183**	41%	**8.316.980**	61%	**1.287.268**	51%	**4.210.200**	48%	**1.220.013**	36%	**3.998.398**	37%	**1.739.253**	39%	**4.681.746**	59%
2.	**EU Funding**		**11.879.919**	**8,995%**	**6.231.229**	**13%**	**746.918**	**3%**	**213.765**	**2,1%**	**189.060**	**1,4%**	**90.915**	**3,6%**	**1.398.181**	**15,9%**	**111.794**	**3,3%**	**1.370.850**	**12,6%**	**75.801**	**1,7%**	1.451.405	**18,2%**
3.	**Own Revenues**		**37.755.952**	**28,588%**	**10.856.699**	**22%**	**6.835.627**	**32%**	**5.145.229**	**51%**	**4.894.209**	**36%**	**1.061.230**	**42%**	**2.331.432**	**27%**	**2.020.577**	**59%**	**707.293**	**7%**	**2.579.693**	**57%**	**1.323.964**	**17%**
3.1.	Tuition Fees	(b)	13.809.989	10,457%	5.215.308	10,7%	3.773.417	17,6%	2.091.235	20,6%	1.156.364	8,5%	30.856	1,2%	228.520	2,6%	745.099	21,9%	5.000	0,05%	562.510	12,5%	1.680	0,02%
3.2.	Sales of Services and Goods	(c)	11.110.284	8,413%	3.980.393	8%	2.174.229	10%	1.088.584	11%	778.433	6%	57.868	2%	493.473	6%	857.067	25%	198.551	2%	1.280.046	28%	201.641	3%
3.3.	Interests		1.063.134	0,805%	154.778	0,32%	17.368	0,1%	20.496	0,2%	77.139	0,6%	600.436	23,7%	14.769	0,17%	663	0,02%	26.898	0,25%	13.589	0,30%	136.999	1,72%
3.4.	Private Donations	(d)	1.739.445	1,317%	182.049	0,37%	74.362	0,35%	607.300	6,0%	416.306	3,1%	9.679	0,4%	120.058	1,37%		0%	214.058	1,97%	87.633	2%	28.000	0,35%
3.5.	Others Revenues and Balance from 2006		10.033.100	7,597%	1.324.171	3%	796.251	4%	1.337.614	13%	2.465.968	18%	362.390	14%	1.474.612	17%	417.748	12%	262.787	2%	635.915	14%	955.644	12%
4.	**Other sources**		**13.920.104**	**10,540%**	**5.845.857**	**12%**	**972.529**	**5%**	**629.073**	**6%**	**157.316**	**1%**	**81.538**	**3%**	**845.862**	**10%**	**55.440**	**2%**	**4.779.952**	**44%**	**24.416**	**1%**	**528.120**	**7%**
4.1.	FCT Research Funding		11.604.552	8,787%	4.756.115	10%	960.733	4%	628.296	6%	92.508	0,68%	81.538	3%	329.601	4%		0%	4.755.761	44%		0%		0%
4.2.	NOVA Funding		29.821	0,023%		0%		0%		0%	19.519	0,14%		0%		0%		0%		0%	5.666	0,13%	4.636	0,06%
4.3.	Funding from Higher Education Institutions		628.536	0,476%		0%		0%		0%	45.289	0,33%		0%	516.261	5,88%	33.794	1,0%	24.191	0,22%	9.000	0,2%		0%
4.5.	Others Revenues and Balance from 2006		1.657.195	1,255%	1.089.742	2%	11.796	0,1%	777	0,01%		0%		0%		0%	21.646	0,6%		0%	9.750	0,2%	523.484	7%
5.	**Funding from other Sectors**		**473.256**	**0,358%**	**343.267**	**1%**	**30.250**	**0%**		**0%**		**0%**	**12.055**	**0,48%**	**1.500**	**0,02%**		**0%**		**0%**	**86.184**	**2%**		**0%**
6.	**Government Funding (PIDDAC)**	(e)	**2.227.888**	**2%**							**878.602**	6,1%											**1.349.286**	14%
	Total Funding (running and investment expenses)		**134.295.833**		**48.807.274**		**21.476.775**		**10.151.250**		**14.436.168**		**2.533.006**		**8.787.174**	**0**	**3.407.825**		**10.856.493**		**4.505.347**		**9.334.522**	

Obs: **(a)** State Current Budget, Supplementary State Funding and Balance (OE)
(b) Total Tuition Fees assessed against students for educational purposes
(c) Taxes and sales of services and goods
(d) Amounts received from individuals or nongovernmental organizations
(e) State Investments Plan for Central Administration Devellopment Expenses; % on Total Funding (running and investment expenses)

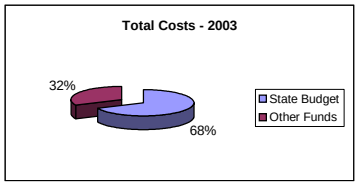
Source: Conta de Gerência

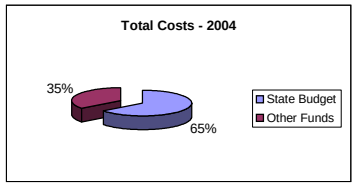
BUDGET - NOVA 2003 - 2007
RUNNING COSTS

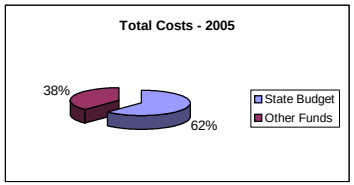
State Budget and Other Funds 2003 - 2007

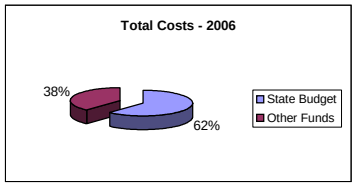
(Euros)

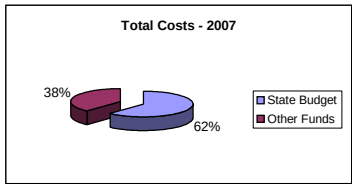
AU	2003			2004			2005			2006			2007		
	Total Costs			Total Costs			Total Costs			Total Costs			Total Costs		
	State Budget	Other Funds	Total	State Budget	Other Funds	Total	State Budget	Other Funds	Total	State Budget	Other Funds	Total	State Budget	Other Funds	Total
FCT	26.042.131	10.443.395	36.485.526	25.593.364	12.650.154	38.243.517	26.374.321	14.792.423	41.166.744	28.526.588	13.464.993	41.991.581	30.382.766	13.233.013	43.615.779
FCSH	13.505.946	5.081.432	18.587.378	12.682.924	5.654.002	18.336.926	12.181.440	6.484.787	18.666.227	13.338.615	5.363.601	18.702.216	12.442.300	7.930.360	20.372.660
FE	4.344.890	3.830.389	8.175.279	4.348.665	4.702.477	9.051.142	4.338.000	4.197.940	8.535.940	4.316.257	4.380.197	8.696.454	4.137.863	5.110.222	9.248.085
FCM	7.955.786	1.072.712	9.028.498	8.271.434	2.299.902	10.571.336	8.767.465	2.924.732	11.692.197	8.559.473	2.591.151	11.150.624	7.694.432	3.589.327	11.283.759
FD	1.478.031	518.728	1.996.759	1.400.682	519.719	1.920.401	1.345.446	780.176	2.125.622	1.348.023	1.038.375	2.386.398	1.274.929	905.253	2.180.182
IHMT	3.795.972	1.520.049	5.316.021	3.734.489	1.465.176	5.199.665	4.087.373	1.734.727	5.822.100	3.959.218	1.729.057	5.688.275	4.166.631	1.697.284	5.863.915
ISEGI	1.317.978	1.792.439	3.110.417	1.273.458	1.904.099	3.177.557	1.352.320	1.751.074	3.103.394	1.259.765	1.964.395	3.224.160	1.219.614	1.935.956	3.155.570
ITQB	3.512.753	3.983.829	7.496.582	3.491.856	4.330.572	7.822.428	3.813.331	4.779.523	8.592.854	3.810.611	11.398.824	15.209.435	3.887.760	6.393.518	10.281.277
ENSP	1.618.460	1.829.401	3.447.861	1.604.232	1.225.685	2.829.917	1.835.916	1.139.919	2.975.835	1.772.793	1.023.421	2.796.214	1.694.514	1.697.333	3.391.847
R	3.731.102	1.669.219	5.400.321	3.284.306	1.248.291	4.532.597	3.998.988	2.603.259	6.602.247	4.355.326	1.535.274	5.890.600	4.339.252	1.560.938	5.900.190
Total	67.303.049	31.741.593	99.044.642	65.685.410	36.000.077	101.685.486	68.094.600	41.188.560	109.283.160	71.246.669	44.489.287	115.735.956	71.240.061	44.053.203	115.293.264











Source: Conta de Gerência

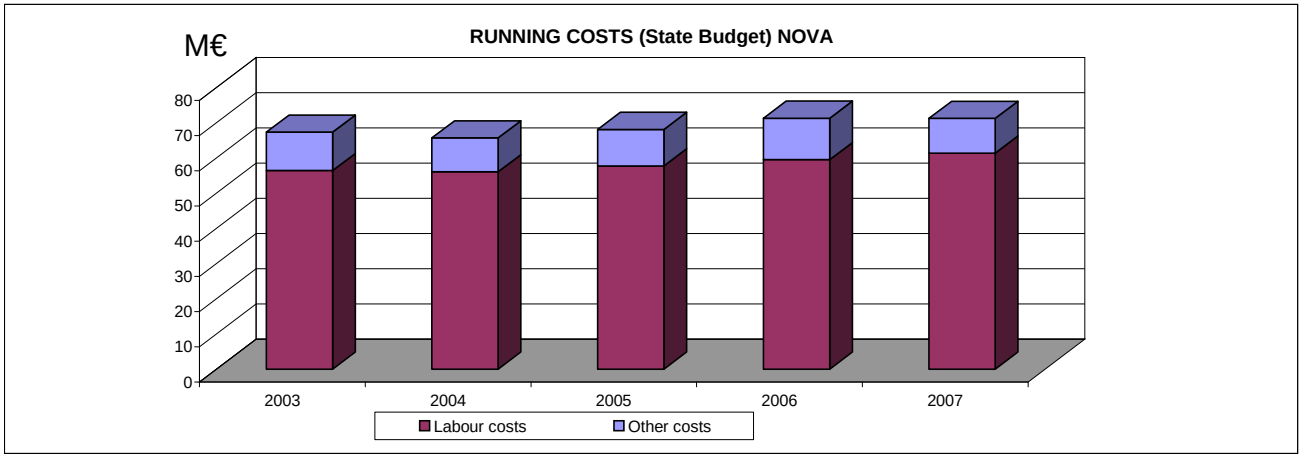
BUDGET - NOVA 2003 - 2007

RUNNING COSTS

Labour Costs and State Budget 2003 - 2007

(Euros)

AU	2003			2004			2005			2006			2007		
	Labour Costs	Total	Labour Costs as % of Total	Labour Costs	Total	Labour Costs as % of Total	Labour Costs	Total	Labour Costs as % of Total	Labour Costs	Total	Labour Costs as % of Total	Labour Costs	Total	Labour Costs as % of Total
FCT	22.239.618	26.042.131	85%	22.113.571	25.593.364	86%	23.138.100	26.374.321	88%	24.905.405	28.526.588	87%	26.395.176	30.382.766	87%
FCSH	13.505.946	13.505.946	100%	12.682.924	12.682.924	100%	12.181.440	12.181.440	100%	12.172.572	13.338.615	91%	11.880.847	12.442.300	95%
FE	3.930.592	4.345.890	90%	4.200.759	4.348.665	97%	4.338.000	4.338.000	100%	4.206.874	4.316.257	97%	4.060.000	4.137.863	98%
FCM	6.556.062	7.955.786	82%	6.700.131	8.271.434	81%	7.311.188	8.767.465	83%	7.253.473	8.559.473	85%	7.396.167	7.694.432	96%
FD	894.665	1.478.031	61%	990.279	1.400.682	71%	1.146.264	1.345.446	85%	1.193.435	1.348.023	89%	1.191.807	1.274.929	93%
IHMT	3.180.487	3.795.972	84%	3.086.200	3.734.489	83%	3.199.174	4.087.373	78%	3.056.490	3.959.218	77%	3.302.470	4.166.631	79%
ISEGI	1.056.458	1.317.978	80%	1.048.633	1.273.458	82%	1.135.154	1.352.320	84%	1.151.683	1.259.765	91%	1.154.329	1.219.614	95%
ITQB	1.940.250	3.512.753	55%	1.929.177	3.491.856	55%	1.980.131	3.813.331	52%	2.018.331	3.810.611	53%	2.017.272	3.887.760	52%
ENSP	1.566.464	1.618.460	97%	1.604.232	1.604.232	100%	1.586.416	1.835.916	86%	1.678.455	1.772.793	95%	1.671.764	1.694.514	99%
R	1.527.510	3.731.102	41%	1.699.675	3.284.306	52%	1.739.406	3.998.988	43%	1.878.631	4.355.326	43%	2.307.411	4.339.252	53%
Total	**56.398.052**	**67.304.049**	**84%**	**56.055.581**	**65.685.410**	**85%**	**57.755.273**	**68.094.600**	**85%**	**59.515.349**	**71.246.669**	**84%**	**61.377.243**	**71.240.061**	**86%**



Source: Conta de Gerência

BUDGET - NOVA
RUNNING COSTS

State Budget and Other Funds 2003

(euros)

AU	Labour Costs			Other Current Costs			Capital			Total Costs			Total Labour Costs as
	State Budget	Other	Total	State Budget	Other	Total	State Budget	Other	Total	State Budget	Other	Total	% of Total Costs
FCT	22.239.618	2.188.439	24.428.057	2.705.577	7.520.458	10.226.035	1.096.936	734.498	1.831.434	26.042.131	10.443.395	36.485.526	67%
FCSH	13.505.946	1.755.975	15.261.921	0	3.139.281	3.139.281	0	186.176	186.176	13.505.946	5.081.432	18.587.378	82%
FE	3.930.592	773.417	4.704.009	385.298	2.777.548	3.162.846	30.000	279.424	309.424	4.345.890	3.830.389	8.176.279	58%
FCM	6.556.062	244.806	6.800.868	1.105.707	491.163	1.596.870	294.017	336.743	630.760	7.955.786	1.072.712	9.028.498	75%
FD	894.665	190.107	1.084.772	471.658	279.900	751.558	111.708	48.721	160.429	1.478.031	518.728	1.996.759	54%
IHMT	3.180.487	169.953	3.350.440	595.497	1.239.472	1.834.969	19.988	110.624	130.612	3.795.972	1.520.049	5.316.021	63%
ISEGI	1.056.458	524.512	1.580.970	245.609	1.088.732	1.334.341	15.911	179.195	195.106	1.317.978	1.792.439	3.110.417	51%
ITQB	1.940.250	1.276.940	3.217.190	1.471.003	2.342.465	3.813.468	101.500	364.424	465.924	3.512.753	3.983.829	7.496.582	43%
ENSP	1.566.464	250.524	1.816.988	22.686	1.397.151	1.419.837	29.310	181.726	211.036	1.618.460	1.829.401	3.447.861	53%
R	1.527.510	151.316	1.678.826	1.823.812	209.476	2.033.288	379.780	1.308.427	1.688.207	3.731.102	1.669.219	5.400.321	31%
Total	56.398.052	7.525.989	63.924.041	8.826.847	20.485.646	29.312.493	2.079.150	3.729.958	5.809.108	67.304.049	31.741.593	99.045.642	65%

Source: Conta de Gerência

BUDGET - NOVA
RUNNING COSTS

State Budget and Other Funds 2004

(euros)

AU	Labour Costs			Other Current Costs			Capital			Total Costs			Total Labour Costs as
	State Budget	Other	Total	State Budget	Other	Total	State Budget	Other	Total	State Budget	Other	Total	% of Total Costs
FCT	22.113.571	2.145.467	24.259.038	2.694.342	7.946.317	10.640.659	785.451	2.558.370	3.343.821	25.593.364	12.650.154	38.243.517	63%
FCSH	12.682.924	2.297.411	14.980.335	0	3.113.082	3.113.082	0	243.509	243.509	12.682.924	5.654.002	18.336.926	82%
FE	4.200.759	1.121.402	5.322.161	97.906	3.438.382	3.536.288	50.000	142.693	192.693	4.348.665	4.702.477	9.051.142	59%
FCM	6.700.131	346.256	7.046.387	1.272.771	1.242.592	2.515.363	298.532	711.054	1.009.586	8.271.434	2.299.902	10.571.336	67%
FD	990.279	121.690	1.111.969	380.590	332.741	713.331	29.813	65.288	95.101	1.400.682	519.719	1.920.401	58%
IHMT	3.086.200	216.467	3.302.667	628.639	1.082.223	1.710.862	19.650	166.486	186.136	3.734.489	1.465.176	5.199.665	64%
ISEGI	1.048.633	573.099	1.621.732	189.915	1.203.010	1.392.925	34.910	127.990	162.900	1.273.458	1.904.099	3.177.557	51%
ITQB	1.929.177	1.562.647	3.491.824	1.461.159	2.131.884	3.593.043	101.520	636.041	737.561	3.491.856	4.330.572	7.822.428	45%
ENSP	1.604.232	188.021	1.792.253	0	964.227	964.227	0	73.437	73.437	1.604.232	1.225.685	2.829.917	63%
R	1.699.675	80.840	1.780.515	1.461.139	1.114.206	2.575.345	123.492	53.245	176.737	3.284.306	1.248.291	4.532.597	39%
Total	56.055.581	8.653.300	64.708.881	8.186.461	22.568.664	30.755.125	1.443.368	4.778.113	6.221.481	65.685.410	36.000.077	101.685.486	64%

Source: Conta de Gerência

BUDGET - NOVA
RUNNING COSTS

State Budget and Other Funds 2005

(euros)

AU	Labour Costs			Other Current Costs			Capital			Total Costs			Total Labour Costs as
	State Budget	Other	Total	State Budget	Other	Total	State Budget	Other	Total	State Budget	Other	Total	% of Total Costs
FCT	23.138.100	1.786.335	24.924.435	2.510.111	9.887.565	12.397.676	726.110	3.118.523	3.844.633	26.374.321	14.792.423	41.166.744	61%
FCSH	12.181.440	2.535.553	14.716.993	0	3.794.844	3.794.844	0	154.390	154.390	12.181.440	6.484.787	18.666.227	79%
FE	4.338.000	1.507.434	5.845.434	0	2.537.700	2.537.700	0	152.806	152.806	4.338.000	4.197.940	8.535.940	68%
FCM	7.311.188	506.056	7.817.244	1.156.447	1.527.071	2.683.518	299.830	891.605	1.191.435	8.767.465	2.924.732	11.692.197	67%
FD	1.146.264	87.101	1.233.365	199.182	544.987	744.169	0	148.088	148.088	1.345.446	780.176	2.125.622	58%
IHMT	3.199.174	266.569	3.465.743	869.095	1.331.272	2.200.367	19.104	136.886	155.990	4.087.373	1.734.727	5.822.100	60%
ISEGI	1.135.154	493.611	1.628.765	182.375	1.056.506	1.238.881	34.791	200.957	235.748	1.352.320	1.751.074	3.103.394	52%
ITQB	1.980.131	1.835.029	3.815.160	1.725.143	1.959.507	3.684.650	108.057	984.987	1.093.044	3.813.331	4.779.523	8.592.854	44%
ENSP	1.586.416	180.563	1.766.979	249.500	828.373	1.077.873	0	130.983	130.983	1.835.916	1.139.919	2.975.835	59%
R	1.739.466	134.340	1.873.806	1.924.683	1.391.061	3.315.744	334.839	1.077.858	1.412.697	3.998.988	2.603.259	6.602.247	28%
Total	57.755.333	9.332.591	67.087.924	8.816.536	24.858.885	33.675.422	1.522.731	6.997.084	8.519.814	68.094.600	41.188.560	109.283.160	61%

Source: Conta de Gerência

BUDGET - NOVA
RUNNING COSTS

State Budget and Other Funds 2006

(euros)

AU	Labour Costs			Other Current Costs			Capital			Total Costs			Total Labour Costs as
	State Budget	Other	Total	State Budget	Other	Total	State Budget	Other	Total	State Budget	Other	Total	% of Total Costs
FCT	24.905.405	1.403.690	26.309.095	2.880.197	9.776.022	12.656.219	740.986	2.285.281	3.026.267	28.526.588	13.464.993	41.991.581	63%
FCSH	12.172.572	2.296.311	14.468.883	838.242	2.983.773	3.822.015	327.801	83.517	411.318	13.338.615	5.363.601	18.702.216	77%
FE	4.206.874	2.091.223	6.298.097	95.404	2.175.137	2.270.541	13.979	113.837	127.816	4.316.257	4.380.197	8.696.454	72%
FCM	7.253.473	522.784	7.776.257	1.009.868	1.721.786	2.731.654	296.132	346.582	642.714	8.559.473	2.591.151	11.150.624	70%
FD	1.193.435	61.400	1.254.835	154.588	752.263	906.851		224.712	224.712	1.348.023	1.038.375	2.386.398	53%
IHMT	3.056.490	320.974	3.377.464	783.303	1.231.281	2.014.584	119.425	176.803	296.228	3.959.218	1.729.057	5.688.275	59%
ISEGI	1.151.683	532.887	1.684.570	78.082	1.346.358	1.424.440	30.000	85.150	115.150	1.259.765	1.964.395	3.224.160	52%
ITQB	2.018.331	2.289.886	4.308.217	1.587.280	2.505.315	4.092.595	205.000	6.603.623	6.808.623	3.810.611	11.398.824	15.209.435	28%
ENSP	1.678.455	235.729	1.914.184	84.638	713.888	798.526	9.700	73.804	83.504	1.772.793	1.023.421	2.796.214	68%
R	1.878.631	229.121	2.107.752	2.225.556	531.078	2.756.634	251.139	775.075	1.026.214	4.355.326	1.535.274	5.890.600	36%
Total	59.515.349	9.984.005	69.499.354	9.737.158	23.736.900	33.474.058	1.994.162	10.768.383	12.762.545	71.246.669	44.489.287	115.735.956	60%

Source: Conta de Gerência

BUDGET - NOVA
RUNNING COSTS

State Budget and Other Funds 2007

(euros)

AU	Labour Costs			Other Current Costs			Capital			Total Costs			Total Labour Costs as
	State Budget	Other	Total	State Budget	Other	Total	State Budget	Other	Total	State Budget	Other	Total	% of Total Costs
FCT	26.395.176	2.295.652	28.690.828	3.209.496	9.280.290	12.489.785	778.094	1.657.072	2.435.166	30.382.766	13.233.013	43.615.779	66%
FCSH	11.880.847	2.908.304	14.789.151	532.346	4.468.945	5.001.291	29.107	553.111	582.218	12.442.300	7.930.360	20.372.660	73%
FE	4.060.000	2.455.446	6.515.446	77.863	2.237.312	2.315.175	0	417.464	417.464	4.137.863	5.110.222	9.248.085	70%
FCM	7.396.167	1.103.183	8.499.349	298.265	1.983.732	2.281.997	0	502.412	502.412	7.694.432	3.589.327	11.283.759	75%
FD	1.191.807	127.416	1.319.223	83.122	617.832	700.954	0	160.005	160.005	1.274.929	905.253	2.180.182	61%
IHMT	3.302.470	564.982	3.867.452	794.966	1.024.566	1.819.532	69.195	107.736	176.931	4.166.631	1.697.284	5.863.915	66%
ISEGI	1.154.329	698.583	1.852.911	65.285	1.079.550	1.144.835	0	157.823	157.823	1.219.614	1.935.956	3.155.570	59%
ITQB	2.017.272	2.297.083	4.314.355	1.433.733	2.327.801	3.761.534	436.755	1.768.633	2.205.388	3.887.760	6.393.518	10.281.277	42%
ENSP	1.671.764	541.048	2.212.813	22.750	1.052.541	1.075.291	0	103.743	103.743	1.694.514	1.697.333	3.391.847	65%
R	2.307.411	251.479	2.558.890	1.597.583	1.042.052	2.639.635	434.259	267.406	701.665	4.339.252	1.560.938	5.900.190	43%
Total	61.377.243	13.243.177	74.620.420	8.115.409	25.114.622	33.230.030	1.747.410	5.695.405	7.442.815	71.240.061	44.053.203	115.293.264	65%

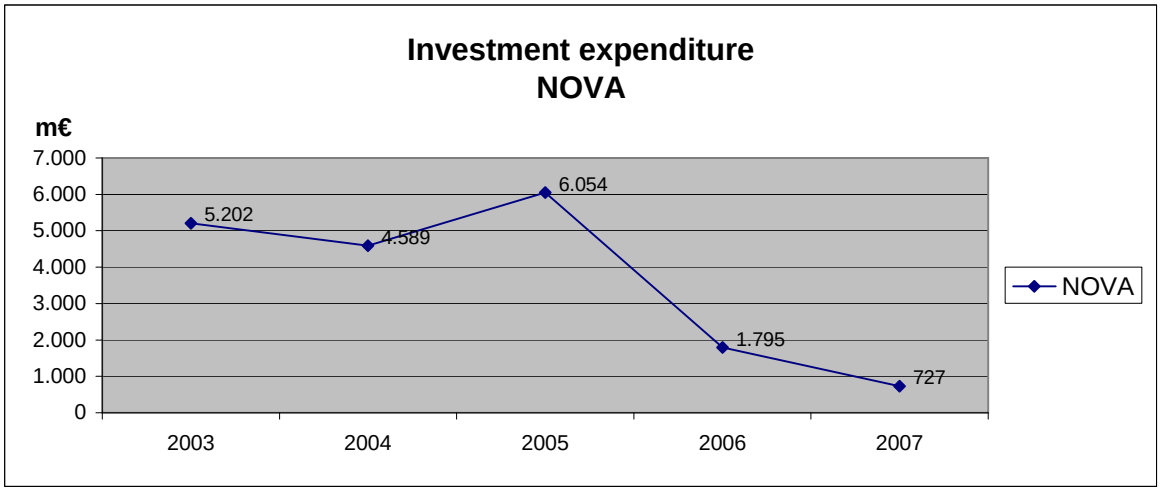
Source: Conta de Gerência

BUDGET - NOVA
PIDDAC 2003 - 2007

INVESTMENT EXPENDITURE

(Euros)

AU	2003	2004	2005	2006	2007
FE	1.245				
FCM	204077		155.774	142.041	16.575
R	4.996.397	4.588.588	5.898.611	1.652.801	710.640
NOVA	**5.201.719**	**4.588.588**	**6.054.385**	**1.794.842**	**727.215**



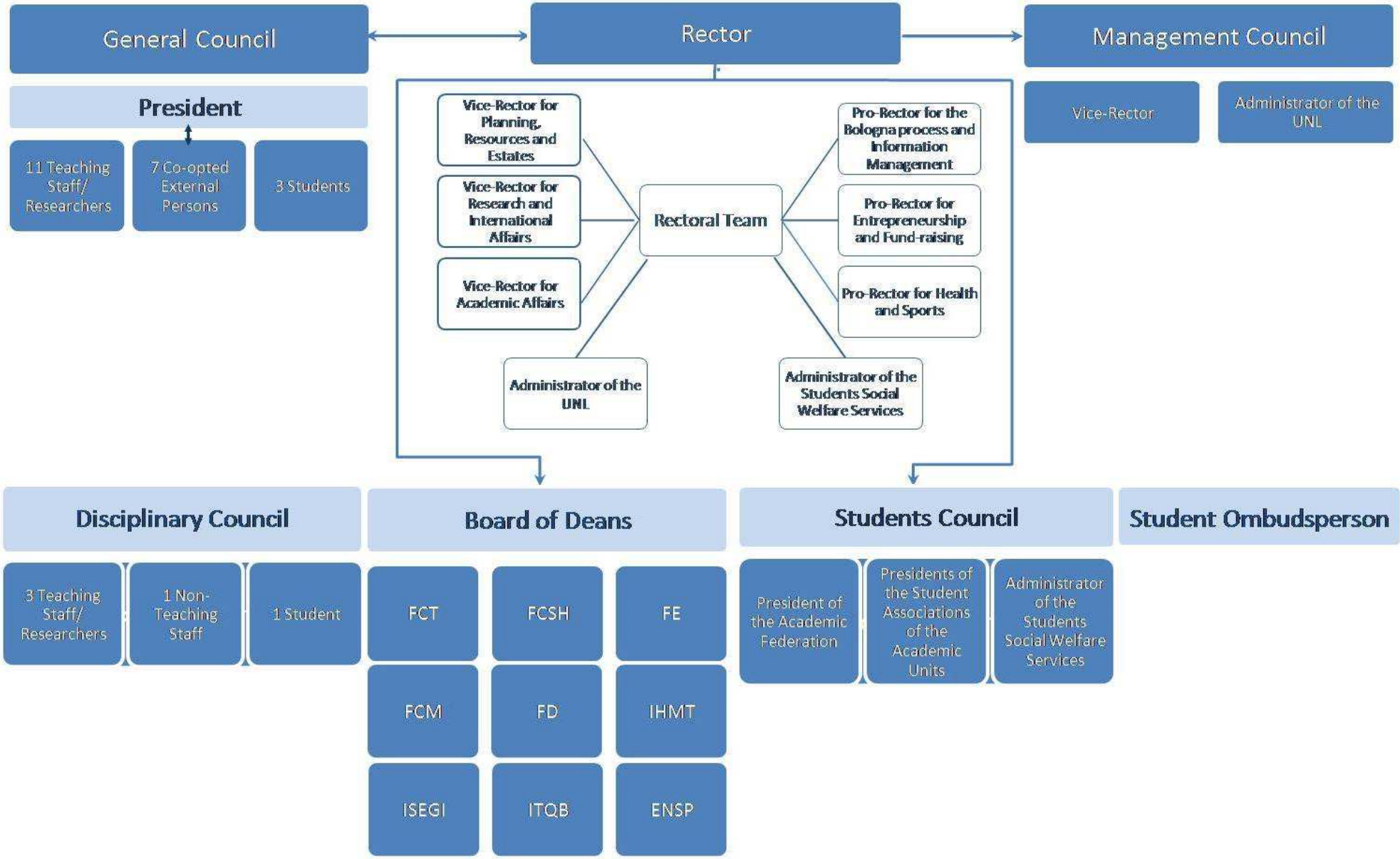
Source: Conta de Gerência

UNIVERSIDADE NOVA DE LISBOA

Self-Evaluation Report

January 2009

Annex 1.1
General governance and management diagram


General Council
Rector
Management Council
President
11 Teaching Staff/ Researchers
7 Co-opted External Persons
3 Students
Vice-Rector
Administrator of the UNL
Vice-Rector for Planning, Resources and Estates
Vice-Rector for Research and International Affairs
Vice-Rector for Academic Affairs
Rectoral Team
Pro-Rector for the Bologna process and Information Management
Pro-Rector for Entrepreneurship and Fund-raising
Pro-Rector for Health and Sports
Administrator of the UNL
Administrator of the Students Social Welfare Services
Disciplinary Council
Board of Deans
Students Council
Student Ombudsperson
3 Teaching Staff/ Researchers
1 Non-Teaching Staff
1 Student
FCT
FCSH
FE
FCM
FD
IHMT
ISEGI
ITQB
ENSP
President of the Academic Federation
Presidents of the Student Associations of the Academic Units
Administrator of the Students Social Welfare Services

UNIVERSIDADE NOVA DE LISBOA

Self-Evaluation Report

January 2009

Annex 2.1
Study on the state of entrepreneurship at UNL

A Study of the State of Entrepreneurship at the New University of Lisbon and Recommendations for Establishing a Robust Entrepreneurship Culture

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Executive Director of the Maryland Technology Enterprise Institute - Mtech
University of Maryland

October, 2008

Background Information

Entrepreneurship within science and technology fields is especially concerned with exploiting intellectual property, creating spin-off companies and offering courses on issues such as:

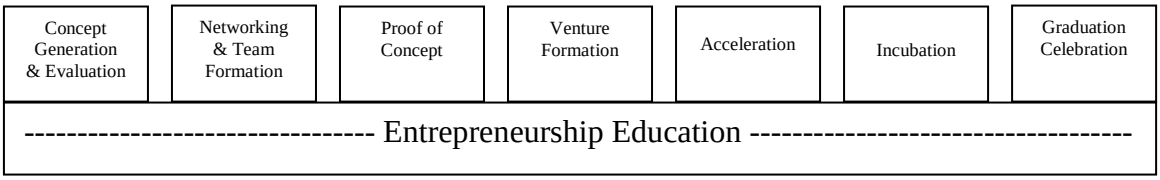
- protecting technology-based intellectual property
- selecting the proper legal structure for the company
- forming the management team
- developing the plan for the business
- acquiring initial funding
- building value in the venture
- exit strategy to harvest profits

Historically, entrepreneurship in social sciences and humanities had focussed on self employment and management of small enterprises; however, substantial web-based enterprises are now possible in topics such as social networking which have the characteristics of entrepreneurship in the science and technology fields.

Entrepreneurship Processes

To have a robust entrepreneurship culture at a university, it is best to have a continuum of activities that support entrepreneurship starting with an idea, concept or research breakthrough, all the way to having a sustainable company.

In general terms, this involves the continuum depicted in the diagram below. This diagram is not meant to indicate that the continuum is necessarily linear, but it is meant to provide an overview of the major processes and to indicate that entrepreneurship education provides the underpinning throughout.



- Entrepreneurship education - both academic courses and non-classroom activities
- Concept generation and evaluation – especially business concepts based on research
- Networking and team formation - among students in different areas of study

- Proof of concept - including pre-seed funding for prototyping
- Venture formation – including forming legal business entity
- Acceleration – including business plan, leadership team and seed funding
- Incubation – further nurturing beyond acceleration
- Celebration/Graduation – spreading the word of successes

Entrepreneurship Education

Four our purposes, the term "entrepreneurship education" is meant in the broadest sense to include: networking events, seminar series, workshops, short courses as well as academic courses. Entrepreneurship education provides the foundation for the remaining processes leading to successful company formation.

For faculty and students who have an entrepreneurial spirit, it is imperative that they learn the basic concepts associated with starting a company. These concepts are best learned through a wide range of non-classroom activities and hands-on, practical entrepreneurship courses which involve the development of a plan for the venture. Faculty and students can learn through activities such as Techpreneur, networking events and workshops.

Concept Generation and Evaluation

In order to actually start a new venture, the faculty member or student needs to develop an idea or concept which is the basis for the venture. For undergraduate students, this is usually through a process of idea generation. For graduate students and faculty, this is most likely based on the results of their academic research. In all cases, it is important to have a process to help evaluate the feasibility and commercial potential of an idea or technology.

Networking and team formation

For entrepreneurship ventures, a founders/management team with diversity of expertise is one of the most important factors in success. Good teams are like a snowball rolling down a hill, gaining in mass and momentum as they go. For technology ventures, the fundamental team includes an individual who is an expert in the technology involved in the venture and an individual who knows business processes, including financial and marketing processes.

Proof of Concept

It has been stated that prototyping is the shorthand of innovation; nevertheless, prototype development often fall outside the realm of funding availability. This critical step in the process of product development includes the development of a device prototype, engineering design, beta testing of software, additional pre-clinical experiments, etc. Without funding for this activity, it is usually difficult to attract interest by customers and investors. Therefore, it is important to find a way to fund such activities. Such funds should be deployed with strict criteria appropriate to commercialization objectives.

Venture Formation

The currently accepted "best practice" steps leading to venture creation consists of (1) invention disclosure, (2) market research, (3) go/no-go decision on IP protection and (4) licensing of IP. When a concept or technology is considered as a platform for a stand-alone company and has potential for a reasonable pipeline of product opportunities, and is likely to be fundable, the decision can be made to form a company. Business students can be engaged in helping startup companies with market research and to develop their commercial goals. Not only does this help the companies, but it also provides real-world experience for those students hired in these emerging companies.

Acceleration

There are many pitfalls encountered by ventures founded by individuals doing it for the first time; therefore, it is important for the university to offer intensive mentoring "acceleration" to the most promising new ventures. Typical criteria for acceptance of a new venture into the accelerator include analysis of:

- Coachability of the founder(s)
- Protectable/unique intellectual property
- Scalable market opportunity
- Feasible to attract/assemble human and financial resources

Once accepted into the accelerator, the accelerator mentors should provide the following services:

- Planning
  - Product planning
  - Customer research
  - Competitive analyses
  - Organizational chart
  - Significant hurdles and risks mitigated
  - Financial model and funding requirements
  - Completed business plan and presentation

- Execution
  - CEO recruiting; team build-out
  - Advisors and experts
  - Angel and grant fundraising
  - Product launch; alphas and betas
  - Graduation from Accelerator

Incubation

For companies that arise from a university and participate in an accelerator, they may be in a position to leave the university environment and locate in commercial space; however, most likely they will prefer to stay close to the university and locate in a university-related incubator where it is convenient to interact with students and faculty and possibly utilize specialized facilities of the university.

Unlike research parks, incubators are not meant to be permanent residences for companies; but rather, provide physical space and support services for a finite period of time – usually no

more that four years. Presumably, after that time, the companies will have matured to the point that they can sustain themselves and be able to move to commercial space; i.e. graduate from the incubator.

Incubators should have policies, procedures and legal agreements that set forth the responsibilities of each party – the university and the company. Good incubators adopt a set of well-thought-out policies and procedures including: entrance criteria (technical and business), services that the incubator management will provide, lease fees and equity to the university (if any).

Celebration/Graduation

Since it is important to let students and faculty know that the institution supports entrepreneurship activities and startup company formation, it is necessary to celebrate such activities that are deemed to be successful. This can be accomplished by having informal receptions to recognize the achievements and/or by posting the successes on the institution's website.

Barriers to the development of an entrepreneurship culture

There are many obstacles which, if present, can impede progress towards developing an entrepreneurship culture in universities including:

- Lack of support from campus leaders
- Lack of a coherent and well thought out plan for developing an entrepreneurship culture
- Lack of understanding on the part of campus leaders regarding the effort and time needed to establish an entrepreneurship culture at the university
- Lack of rewards, incentives, recognition for faculty for participation in entrepreneurial activities including teaching entrepreneurship courses, starting businesses, etc.
- Bureaucracy and organizational inertia
- Policies that are not aligned with support of entrepreneurship
- Conflicting academic philosophies of the role of entrepreneurship in higher education
- Feeling on the part of faculty that entrepreneurship and business enterprises conflict with academics
- Lack of cooperation among different faculty from different departments
- A negative image of entrepreneurs as not being ethical
- Courses taught by educators who have no entrepreneurial experience
- Lack of understanding of potential sources of funding of entrepreneurship activities
- Lack of recognition that universities are an important driver of economic development
- Practice-oriented modules, necessary in teaching entrepreneurship, can be seen as not measuring up to true academic standards

In addition to the opposite of the above barriers, the following are important for developing a successful entrepreneurship culture:

- Sustainability of funding for university entrepreneurship activities
- Entrepreneurship culture as an explicit strategic goal
- Entrepreneurship education and activities valued by the institution

- A cadre of faculty strongly committed to entrepreneurship activities
- Activities which include people with practical entrepreneurial experience
- Activities to provide students with a diversity of learning experiences
- Recognition of successful entrepreneurship activities by faculty and students
- A clear intellectual property policy, which encourages entrepreneurial activities

Lessons Learned from Entrepreneurship Education Experience

- Establishing a robust entrepreneurship culture at a university requires many activities over a sustained period of time

- When developing an entrepreneurship culture, courses in entrepreneurship should be offered to students without additional cost to them so as not to create a barrier to student involvement

- Involvement in entrepreneurship activities by "early adopter" faculty and students should be voluntary. Once some successes are achieved, others ("late adopters") will likely be attracted to follow

- While it is useful to have activities that all students and faculty can participate in, major activities and resources are best concentrated on faculty and students who exhibit a strong entrepreneurial spirit

- Often having rigorous criteria for admittance for students to be accepted to participate in substantial entrepreneurship activities will result in: increasing the level of interest because it will be viewed as more valuable and special, and it will result in expending resources on those who truly want to do something entrepreneurial

- In parts of the university where the scale of technical activity is substantial, it is most effective to have company-building support activities close to those sources of innovation; however, strong efforts should be undertaken to connect the innovators with students and faculty from other disciplines, especially economics/business

- To establish a robust entrepreneurship culture at a university, students need to begin thinking about it early in their educational process; therefore, entrepreneurship activities should involve faculty and students at all levels – undergraduate and graduate

- Most students and faculty don't know enough about entrepreneurship to know they could start and operate a company, and therefore don't consider doing so. Publicizing entrepreneurship successes of peers is important to let others know that it can be done

- In most situations, the fraction of students and faculty who have a strong entrepreneurial spirit is small. Identifying those and providing services to them is the best use of resources. Accordingly, it may be inefficient and counterproductive to provide extensive resources to those who are not sufficiently interested to follow through

- Technology-based startup companies need to have a management team with both technical and business skills. Techniques need to be developed to acquaint technical and business students and faculty with each other

- Student teams in entrepreneurship courses are most effective when they self form rather than are formed by the instructor. Therefore, techniques should be used to help them get to know each other

- Traditional lectures may not be the most effective way of teaching technology entrepreneurship; rather, such courses may be more effective when individuals having direct tech entrepreneurship experience are involved, and such courses can be effectively taught by regular faculty supplemented by lectures given by technology entrepreneurs and by individuals with relevant experience such as angels, venture capitalists and intellectual property attorneys.

- Entrepreneurship is best learned by doing, and a method that has proved to be effective in entrepreneurship courses is to facilitate the formation of teams and require each team to develop a concept for a company and to develop a business plan as part of the course. Case studies are useful as a teaching tool; however, they are not a substitute for the learning associated with students developing business plans based on their own ideas. In situations where case studies are used, they are most effective when they are for existing companies in a setting similar to that where the students are likely to start companies

- Since there are many ways of achieving entrepreneurial success, students should be exposed to as many different paths to entrepreneurial success as is practical

- New venture/business plan activities should be based on real business concepts by the students who are developing the plans

- Entrepreneurship classes comprised of a good mix of technical, business and other non-technical students is most desirable because the students discover new ways of thinking and when teams are formed, they have a much better chance of success than if only students with similar majors are represented on teams

- Creativity workshops can be very effective in helping students to think in new ways. This is especially important for engineering students who, by their discipline, are taught to think systematically

Success measures

In order to judge whether progress is being made towards the development of an entrepreneurial culture, some measures are qualitative and others can be measured numerically. In any case, it is important to put in place a process for tracking entrepreneurial progress of students and faculty. Some important qualitative data which can be measured are by implementing surveys of students and faculty include:

- Customer (student and faculty) satisfaction with courses/activities/support provided
- Progress in entrepreneurial mindsets of students (based on, for example, Likert-scale surveys at the beginning and end of participation in entrepreneurial activities) assessing:
    - Self-efficacy – ability to understand and influence entrepreneurial processes
    - Locus of control – acceptance of responsibility for one's own entrepreneurial success
    - Self esteem – appraisal of self worth relative to entrepreneurial endeavours
    - Interpersonal relationship skills – ability to overcome entrepreneurial barriers involving other people including those inside and outside the company.

Measures that can be tracked quantitatively include:

- number of start-ups created by students who have taken entrepreneurship modules
- number of start-ups created by faculty
- revenues, profitability of above companies, over time
- number of jobs created by the above start-ups, over time
- number of new patents issued as an outcome of entrepreneurial modules

In order to determine the impact of entrepreneurial activities, the above measures can be compared with similar data for companies founded by the overall population of university graduates.

Also, since entrepreneurship education is valuable to students even though they may not start companies and is also valuable to the companies that employ them, tracking the level and quality of their employment is useful.

Meetings with Faculty and staff of UNL – May 2008

Rectory
Paulo Soares de Pinho
Rita Goncalves

Economics/Business
Paulo Soares de Pinho
Paulo Gomes
Daved Barry

Social Sciences and Humanities
Luis Vicente Baptista (Host at Social Sciences and Humanities)
Carlos Correia, CITI
Maria Lobo, Linguistics
Salwa Castelo-Branco, Coordinator of INET (music research team)
Nazaré Roca, Coordinator of E-Geo (geography research unit)

FCT
Fernando Santana, Director FCT
Susana Barreiros (host at FCT)
Adolfo Steiger-Garcao – Madan Park and Electrical Engineering

Joao Paulo Pimentao – CTO, holos
Bernardo Henriques – Co-founder and CEO, Acacia Semiconductor/S3
Luis Flores – CEO, Introsys
Nuno Flores – Managing Director, Introsys
Prof. Jose Barata. Introsys
Rui Barreiras – CFO, In4tools
Edmundo Nobre, Y-Dreams

Joint meeting:
Célia Costa Cabral – Department of Applied Social Sciences
Nuno Cachadinha - Civil Engineering Department
José António Almeida - Earth Sciences Department
Paula Barros - Chemistry Department
Pedro Baptista - Life Sciences
Carlos Jorge Dias - Materials Department

Ana Aguiar Ricardo – Chemistry Department
- tour of laboratory
Rui Magalhaes Baiao – Electrical Engineering Department
Rodrigo Martins, Chair Materials Department
- tour of materials facilities

Institute of Statistics and Information Management

Marco Painho

FCM
Miguel Correia, President, FCM
José Miguel Caldas de Almeida, Dean FCM

ITQB/IBET
Luis Paulo Rebelo , Vice-Director, ITQB
Paula Marques Alves, Director Animal Cell Technology Laboratory, IBET
Manuel Jose Teixeira Carrondo, Prof. Chemical and Biological Engineering, CEO, IBET

Meetings with Students of UNL – October 2008

ITQB
Contact: Prof. Luís Paulo Rebelo / Profª Paula Marques Alves

- Students:
  - Ines Trindade
  - Nuno Carinhas
  - Rui Feriera

- 5 PhD students attended Techpreneur the summer of 2008
- Probably 5 to 10 percent of PhD students interested in entrepreneurship
- Students would like:
  - Seminar series at IBQT location with seminars providing educational material associated with entrepreneurship
    - Basic concepts, steps, processes, IP

        - What makes a good idea
        - What steps are necessary to develop an idea
        - Business Plans
        - Talks by entrepreneurs who have formed companies from IBQT/IBET and FCT (students would relate better to such speakers
        - Ability to contact speakers for follow-up Q&A
    - Free lunch after talks to encourage attendance
    - An "Entrepreneur Day" emphasizing technology companies that have been started from UNL, particularly IBQT/IBET and FCT with group exercises like those of Techpreneur last summer
    - Development of a method to connect students in an effective way
        - At IBQT/IBET
        - At other campuses

Faculdade de Economia
Contact: Profª Luisa Agante / Prof. Luis Lages

- Students – all close to finishing masters degrees in management:
    - Kwame Gomes
    - Vidette Costa Martini
    - Rita Sales Luis
    - Oana Roxana Stoica
    - Huseyin Ozkan
    - DiagoValez
- Inputs
    - At least one entrepreneurship course should be mandatory for undergraduates
        - This course should be practical and not theoretical
    - Previous seminars were not well organized and wasted students' time
    - Activities of student entrepreneurs should be "advertised"
    - Some students have businesses, but few others know about them
    - School websites are too local; similarly, emails to students about entrepreneurship activities are too local

FCM at Campo Mártires da Pátria
Contact: Prof. João Gamelas

- Faculty
    - Joao Erse de Goyri O'Neill
    - Ferdando Miguel Teixeira Xavier
    - Miguel Seabra
    - Francisco M.C. Driere de Andrade
- Students
    - Manuel Abecasis – Student association, third year student
    - PhD students
        - Cladia Quaresma
        - Dario B. Rodrigues – FCT
        - Tiago Jose Penira
- Students and faculty enthusiastic about a one-day workshop
    - General session in the morning
    - Two separate sessions in the afternoon
        - One oriented towards entrepreneurial issues associated with setting up small clinics or working in clinics

- Second one oriented towards research students

FCSH at Campus Avenida de Berna
Contact: Prof. Luís Baptista

- Students
  - Antonio Rocha – Masters student from FCT
  - Jaime Reis – INET
  - Ana Ramalho – philosophy
  - Diogo Carvalho – Musicology
  - Rosalice Pinto - Linguistics

- Inputs
  - Antonio started a successful summer course on entrepreneurship that was given last summer with 31 undergraduate and graduate students with diverse social science and humanities majors
  - Two of the above attended Techpreneur and thought it was very good
  - The consensus of the students was that one practical elective entrepreneurship course serving FCSH students was adequate for now, and the summer course is an adequate beginning
  - The complexity of laws governing companies seems to be a barrier to company formation, and the students recommended that the law school and/or practicing attorneys provide assistance
  - Networks of angels and mentors was suggested

FCT – Campus Caparica (E-Day)
Contact: Profª Susana Barreiros

- Students
  - Various students at E-Day
- Inputs
  - Students would like to have a practical undergraduate entrepreneurship course available at FCT
- Company representatives
- Inputs
  - Would like to have a common laboratory at FCT or Madan Park furnished with general chemical and biotechnology equipment for them to use

<u>Major Findings</u>

- UNL is already making a good start to the development of an entrepreneurial culture
  - Strong support for entrepreneurship by Rector and Pro-Rector
  - Excellent SeedINova plan
  - Successful first Techpreneur course
  - Interest by faculty and students of all campuses in entrepreneurship activities
  - Summer entrepreneurship course initiated by faculty of Social Sciences and Humanities and delivered by Madan Park personnel
  - Operating incubator at FCT (Madan Park) and quasi incubator at IBET
  - Interest regarding entrepreneurship by faculty
  - Substantial enthusiasm regarding entrepreneurship activities by students
  - Quality and quantity of research sufficient to generate technology-based startups

- Need for, or direction to existing private, legal/accounting assistance in starting companies
- Need for improved intellectual property process
- Great need for networking and teaming among students (and faculties) of the different departments and campuses

Details of Findings

Meeting with Pro-Rector Prof. Paulo Soares de Pinho at Reitoria UNL (Campus Campolide)

- Pro-Rector is exceptionally knowledgeable about entrepreneurship
- A plan for developing an entrepreneurial culture has been initiated - SeedINova
- Techpreneur launched in June

Meetings with FCSH professors at Av. Berna; Contact: Prof. Luís Baptista

- A successful summer course with 31 students in entrepreneurship was offered in July, 2008
  - Organized by FCSH

- Music Technology
  - Research in cross areas of music, robotics and artificial intelligence is impressive and may generate intellectual property
  - Excellent work in digitizing Portuguese music from obsolete media
  - Workshop in entrepreneurship for faculty and students – both low and high tech – would be welcomed

- Linguistics
  - Some interest in entrepreneurship

- Geography
  - Research in:
    - Geographic modeling, cities and spatial planning
    - Environmental studies
    - Geography of Information Society
    - Transport networks and systems
  - Plan to participate in Techpreneur course

Meeting with ISEGI professors at Campus de Campolide (ISEGI)
Contact: Prof. Rui Magalhães Baião

- Information management
  - Don't have an e-plan, but want to take part if UNL develops e-activities
  - e-learning platform may be of commercial value

Meetings with FCT professors at Campus da Costa da Caparica; Contact: Prof Susana Barreiros (DQ)

- Visit to Madan Park – tour by Prof. Steiger: (Campus da Costa da Caparica)
  - Visited four companies in current incubator

- Outstanding new facility coming on-line soon

- Meetings with incubator companies:

  - Holos
    - Founders provide lectures in entrepreneurship in PhD program
    - 27 employees
    - Google partner
    - Software developer
    - Monitoring and AI
    - Cooperation with Computer Science Department
    - Seimens, SAP and Holos
    - 4 projects with European Space Agency – reports and alarms
    - Mapping part of Milky Way

  - S3
    - Started in 2004
    - 2 professors and 1 PhD student
    - Student driver
    - Bootstrapped
    - Analog circuit designs
    - 12 engineers, 4 with PhD's, 8 w/masters
    - Acquired by Irish company, keep in Portugal

  - IntRoSys
    - Two brothers are founders
    - Professor Prof. Jose Barata helping too
    - 38 employees, 29 engineers
    - Plc and robot programming
    - R&D, industrial automation, service robots
    - Lots of work with Ford Motor Company

  - Y-dreams
    - Very impressive company
    - Faculty and grad student founders
    - >100 employees
    - Currently near break even point

  - In4Tools
    - Software company
      - Desktop solutions
      - Web solutions
      - Digital pen
      - Information management

Meeting at GAPI (Campus da Costa da Caparica)

- Discussion with group of faculty
  - Group was generally enthusiastic about technology entrepreneurship

- Celia Costa Cabral – Applied Social Sciences, Economics and Management
    - Showed a lot of interest in developing an entrepreneurship course at FCT
- Nuno Cachadinha , Civil Engineering Department
    - Worked with a student team that competed in a business plan competition
- Carlos Jorge Dias – Materials Department
- Jose Antonio Almeida, Earth Sciences Department
- Paula S. Brarros , Chemistry Department
- Pedro Vigna Baptista, Life Sciences

Meeting with FCM professors; Contact: Prof. João Gamelas

- Met with and toured laboratories and classrooms with Miguel Correia, President, FCM
- Met briefly with José Miguel Caldas de Almeida, Dean FCM
    - Medical students have little time for extracurricular activities
    - Medical faculty busy with faculty and hospital duties
    - A one-day workshop on entrepreneurship would probably be useful

Meeting with IBET/ITQB professors at ITQB Oeiras: Contact: Prof. Martinho Simõe and Professor Paula Marques

- Outstanding researchers, research and facilities
- Eight spin-offs to date
    - Some are in ITQB/IBET spaces, two located in nearby buildings
    - None have grown substantially as of now

Analysis and Recommendations

Analysis

Many of the foundational elements for establishing a robust entrepreneurship culture at UNL are present:

- Strong support from the Rector and Pro-Rector
- Pro-Rector who is very knowledgeable about entrepreneurship
- Groups of faculty and students who are enthusiastic about entrepreneurship at:
    - FCT
    - ITQB/IBET
    - FSCH
    - FE
    - FCM
- Excellent faculty, research and facilities at FCT and ITQB/IBET
- Over ten technology-based startup companies from FCT and ITQB/IBET
- Operating incubators at FCT and ITQB/IBET
- New Madan Park incubator facility becoming operational soon

Faculties that are somewhat interested and don't want be "left behind" include:

- ISEGI

- Linguistics
- Information management

Looking at the opportunities for establishing an entrepreneurial culture at UNL from a different point of view, it is clear that the technical strengths are at FCT and ITQB/IBET; knowledge about the business aspects of entrepreneurship reside in the Economics/Business faculty and some faculty in the Social Sciences and Humanities have interest in mainly non-technical entrepreneurship, although teaming involving all of these faculty should be encouraged and facilitated. For example, having a business plan competition in which each team would be comprised of students from technical disciplines, economics/business disciplines and social sciences and humanities disciplines, as suggested by the Pro-Rector, would facilitate the desired networking of students from diverse majors.

As expected, faculty involvement in entrepreneurship varies from direct participation in new ventures, as some FCT faculty have done, to supporting the concept, but not wanting to participate directly. Although no faculty were encountered who expressed opposition to on-campus entrepreneurship, on almost all campuses there are some faculty who are opposed, and it is expected that this may be the case at UNL. Unless such faculty are obstructionists, this is usually not a major obstacle, since participation in entrepreneurship activities should be strictly voluntary, and those who choose not to be involved are free not to participate.

From the point of view of the entrepreneurship processes: Entrepreneurship education – both academic courses and non-classroom activities; Idea generation and evaluation; Team/venture formation; Acceleration; and Incubation, the only one that seems to be currently present at UNL, at least to the extent necessary to support a robust entrepreneurship culture, is incubation. However the proposed SeedINova plan will go a long way towards filling these gaps, and a good deal of what is recommended in this report is included in the SeedINova plan.

Activities Considered for Developing an Entrepreneurship Culture at UNL

Below is a list, in alphabetical order, of entrepreneurship activities that have been instituted at various universities around the world. The appropriateness to a particular university depends on many factors including: university size, centralized or de-centralized campus, quantity and quality or research conducted, diversity of degree programs, and many others.

- Activity to generate/evaluate new business ideas; e.g., “Idea laboratory”
- Association of alumni who are successful entrepreneurs to provide advice, guidance, mentorship and perhaps financial support
- Brochures and posters
- Center for entrepreneurship
- Committee of faculty and staff who are the leaders of entrepreneurship activities
- Courses in entrepreneurship
- Creativity workshops
- Entrepreneurial exhibition
- Entrepreneurship certificate for taking a number of entrepreneurship courses
- Entrepreneurship notation on diploma for taking entrepreneurship course(s)
- Entrepreneurship clubs
- Entrepreneurship minor

- Entrepreneurship newsletter
- Entrepreneurship office hours by mentors, coaches and entrepreneurs
- Evaluation of commercial potential by economics/business students
- Faculty visits to other universities with established entrepreneurship programs
- Fund to support the development of prototypes
- Gallery of current and alumni entrepreneurs
- Hosting a major conference or workshop in entrepreneurship
- Integrating entrepreneurship modules into existing courses
- Interdisciplinary engineering/science projects for development of innovative products
- Internships for students in technology startup companies
- Mentorship programs (entrepreneurs and/or professionals mentor students)
- New venture plan (business plan) competitions
- Patent fund –sufficient to patent promising university intellectual property
- Project to evaluate commercial potential of university intellectual property
- Promotion of entrepreneurship activities through flyers, brochures, websites, etc.
- Rewards for entrepreneurs
- Seed fund
- Seminar series in entrepreneurship
- Sessions in classes on intellectual property
- Sessions in which students give short presentations regarding a new venture idea with critique by a panel of experts
- Website for entrepreneurship activities
- Workshop for faculty on best practices
- Workshops to initiate students and faculty in entrepreneurship

While all of the above listed activities have value, it is recognized that funding and time are limited. Although activities in the above list may not be included in the recommendations to follow, this should not be interpreted such that they would not be useful, and UNL may wish to consider implementing some them.

Gap Analysis and Recommended Activities

General:

The question of centralized vs. de-centralized activities is an important one especially for a university such as UNL which has campuses located some distance from each other, and both have advantages and disadvantages. The main advantage of centralization may be management efficiency. On the other hand, an important advantage of de-centralization in which entrepreneurship activities are close to the sources of innovation is that necessary relationships between the innovators (faculty and students) and the people providing the entrepreneurship activities are more likely to be effective. In terms of course offerings and workshops, a de-centralized approach seems most likely to provide the desired results. This is especially applicable for FCT and IBQT/IBET; however, some activities such as networking and competitions will likely work best on a centralized basis.

It is not clear that UNL has functioning polices and procedures regarding faculty and student generated intellectual property. In general, universities must decide whether to require faculty to assign rights to IP to the university. This is an important decision which should not be made in the affirmative by default. If universities do require this, then they must have a

functioning technology transfer office (TTO) with staff and funds to evaluate disclosures, decide which to patent, and pay for the legal work necessary to obtain patents. If faculty are not convinced that the TTO has policies, procedures for evaluating disclosures and is funded properly to obtain protection of high-quality disclosures, then they will be unlikely to file disclosures, and the process will not work. Many (if not most) universities across the world that require faculty to assign IP rights to their institution, spend considerable funding on patenting, and unfortunately, the result is insufficient payback to justify the IP protection process and costs. Therefore, it may be useful for UNL leaders to seriously consider what would be best for its particular situation. Related to this issue is an article in Nature by William Destler, former Provost of the University of Maryland and now President of the Rochester Institute of Technology which puts forth the notion that "fueling innovation requires a different kind of collaboration between industrial and academic researchers."

Specific:

The specific activities listed below are recommended as being necessary to support an entrepreneurship culture at UNL.

Coordination and Promotion:

Gap Analysis:

- A faculty committee already exists that is considering entrepreneurship activities
- A similar committee of entrepreneurial student leaders from the various campuses/departments is not present
- A website for Techpreneur exists

Recommendations:

- Continue or make permanent the committee of faculty and staff who are the leaders of entrepreneurship activities from the campuses
    - Membership of this committee should be for a finite period of time, with new members added to the committee as appropriate
    - Among the tasks of the committee would be to:
        - Provide a link among distributed entrepreneurship activities
        - Coordinate entrepreneurship activities across the campuses/departments of UNL.
- Establish a committee of entrepreneurial students representing the departments that have interest in entrepreneurship
    - One way of composing the committee is to let each student association select an entrepreneurial member to join the committee
    - Among the tasks of the committee would be to:
        - Organize student-driven entrepreneurship activities
        - Make inputs to the campus leadership, perhaps via the faculty committee
- Develop a centralized UNL entrepreneurship website and/or links to departmental websites to promote entrepreneurship, stimulate networking and collaboration, publicize successes, and to inform of future entrepreneurship activities
    - The UNL entrepreneurship website should have links to places where students can go to get advice on things such as the legal/accounting aspects to set up a company; for example, legal/accounting services, intellectual property, services provided by UNL

Entrepreneurship Education:

Gap Analysis:

- Several entrepreneurship educational activities are present:
    - General
        - Techpreneur
    - Economics
        - One undergraduate course on Entrepreneurship
        - Masters:
            - Entrepreneurship course
            - Entrepreneurial Finance & Venture Capital
        - MBA: Entrepreneurship, Entrepreneurial Finance and Seminar on Tecno-entrepreneurship
    - An entrepreneurship module will be added to the required PhD curriculum at ITQB beginning in 2010
    - FCSH summer course on Entrepreneurship – provided last summer and to be repeated in successive summers

Recommendations:

- Entrepreneurship education – At no additional cost to students, researchers and faculty, provide the following educational courses and activities:
    - A practical, "hands-on" entrepreneurship course should be available to undergraduate students at each of the campuses that have undergraduate programs. This course should introduce students to the basic processes involved in starting enterprises and should be aligned with each campus; e.g., technology at FCT and IBQT/IBET, and small enterprises and social entrepreneurship at FCSH (See Appendix I for examples).
        - Develop a one-day workshop at FM with a general morning session and two different sessions in the afternoon – one oriented to PhD students and the other to medical students who are likely to start or work in private clinics
        - For masters and PhD students at FCT, develop at least one academic entrepreneurship course tailored to technology entrepreneurship
        - Consider if the economics entrepreneurship courses are sufficient to serve non-technical undergraduate, masters and PhD students, and if not, then develop one undergraduate course and one graduate course tailored to non-technology entrepreneurship perhaps with some technology entrepreneurship content. The results of the summer course being offered for the summer of 2008 may have provided useful information and insights
        - Begin an entrepreneur seminar series with seminars given by Portuguese entrepreneurs, such as those who have started companies at FCT and IBQT/IBET and appropriate service providers. The series could perhaps rotate among the campus locations with each seminar tailored to the campus where the seminar is taking place
        - Develop an activity at the beginning of the academic year to stimulate interest in entrepreneurship – this could be based on the FCT E-Day model
        - Begin a New Venture (business) Plan Competition culminating near the end of the academic year
        - Build on the E-Day at FCT by having an annual joint E-Day at FCT and IBQT/IBET in alternate years

- It is highly recommended that UNL make full use of its own faculty and students who have started companies like those in Madan Park, FCT and IBQT/IBET and at other locations near UNL. These individuals should be readily available and students should relate to them better than to individuals from large companies or from other countries.

Networking, Idea Generation and Evaluation and Team Formation:

Gap Analysis:

- Currently, a systematic process for networking and subsequent forming of teams among students and faculty of different disciplines is not present
- A systematic process for idea generation and evaluation of market potential seems to be currently present

Recommendations:

- Develop an ongoing activity to facilitate networking and subsequent teaming of students from diverse majors, especially FCT, ITQB/IBET, Economics and Social Sciences/Humanities (See Appendix I for examples).
  - An effective method is to host a breakfast or lunch activity with a well known presenter who will draw faculty and students to attend, and then give each attendee a short amount of time (30 seconds to one minute depending on the number of attendees) to introduce themselves and to state there entrepreneurship interests. The more current version of this is called "speed dating." This will facilitate matchmaking and future teaming.
- Begin an activity (possibly called something like IdeaLab) in which select students who have strong entrepreneurship interests give short presentations of new ideas and a group of entrepreneurs and other professionals at the university or outside provide feedback.
- Develop a process for evaluation of business ideas
- A proven way of doing this is to have teams that have generated business ideas to present to a group of people with entrepreneurial experience with Q&A and constructive feedback - This activity could possibly be coupled with "entrepreneurship office hours." (See Appendix I for example of a entrepreneurship office hours website)

Proof of Concept (including pre-seed funding):

Gap Analysis:

- Currently, there is no proof-of-concept process/prototyping process or funding to support such activities. Prototyping, even rudimentary prototyping in the very early stages, is critical and powerful step in the development of a company and its products.

Recommendations:

- At FCT, provide some space with rudimentary electronic and mechanical equipment and materials for students to build prototypes.
- Consider providing a common laboratory at FCT or Madan Park furnished with general chemical and biotechnology equipment for entrepreneurs to use in developing biotechnology products. It should be noted that outstanding biotechnology facilities exist at IBET, and perhaps these facilities could be utilized by biotech companies at FCT which need access to advanced scale-up equipment (see Appendix I for example website)
- Develop a fund to support the development of product prototypes by select faculty and students who have promising technology/business ideas. The word "prototypes" is used in

a general sense to mean physical devices as well as the equivalents for IT and life science concepts.

Acceleration:

Gap Analysis:

- Currently, no systematic acceleration activities exist

Recommendations:

- Consider hiring one full-time person experienced in technology startup company formation and/or technology venture capital to provide intensive mentoring (acceleration) of new technology startups. This is a necessary process in the development of spinoffs from UNL, especially from FCT and IBQT/IBET (See Appendix I for example).
- Consider one or both of the following:
    - A seed fund to provide funding to support the initial stage of select startup ventures
    - An angel network that would consider providing funding to UNL spinoffs
- Establishment of a network of entrepreneurial mentors who will provide advice on specialized topics such as intellectual property protection
- Develop a cadre of mentors to provide "entrepreneurship office hours" on a rotating basis at the various campus locations. This cadre of mentors could include individuals knowledgeable in:
    - Legal and accounting aspects of company formation
    - Intellectual property and IP processes at UNL
    - Entrepreneurship support organizations at UNL
    - Entrepreneurship in fields aligned with the location of the office hours
    - Economics/business

Incubation:

Gap Analysis:

- Technology based startup companies are occupying space; i.e., incubating, at FCT and IBQT/IBET. This appears to be happening on an informal basis. Arrangements between the university and the companies are not clear; e.g., how these informal incubators are managed, what services are provided by the university, if any, and what the payback to the university would be from successfully incubating companies.
- Madan Park appears to be a high-quality physical facility; however, policies and procedures for it and how it will be managed have not been made available. From the available information, it is not clear whether it is intended to be an incubator or research park, and there are substantial differences in the two. The word "park" leads one to think of Madan Park as a research park. Conversely, the statement from the web page for Madan Park: "The park rents space for incubation of companies, supporting the start-up and growth" leads one to think that it is an incubator.

Recommendations:

- Policies and procedures need to be put in place regarding the usage of "incubator" space at FCT and IBQT/IBET.
- In general, it must be decided (or perhaps has been decided) whether Madan Park will be a true incubator of a research park. If it is a research park, then it is basically operated as leased space, and usually a tenant can stay as long as they pay the lease fees. Hopefully, selection of tenants is based on their having mutually beneficial relationships with the

university. On the other hand, if Madan Park is to be an incubator, then companies need to "flow through" the incubator in finite periods of time; i.e., to enter the incubator, gain maturity over a period of time and graduate. This means that a startup company (hopefully with significant potential for growth) enters the incubator, develops its products and/or services, obtains funding and customers while in the incubator, and graduates after a finite amount time. The best companies outgrow the incubator, some fail, and others remain small. In all cases, companies would remain in the incubator for a finite time. At least one full-time person needs to provide mentoring for the companies in the above entities, and if both are true incubators, the person should have extensive technology startup experience. Generally, an incubator the size of Madan Park should have a director who has extensive technology startup experience and an administrative assistant.

- The Madan Park Director, or another individual or individuals should manage and provide services (advice, connections, etc.) to the incubating companies.

Celebration/Graduation

Gap Analysis:

- Currently, there does not seem to be any graduation or celebration for companies that spin out of UNL and/or graduate from incubation

Recommendations:

- Develop activities that celebrate new companies that are started by UNL faculty and students
- Whenever a company graduates from one of UNL's incubators, there should be a celebration hosted by high-level UNL officials
- Recognize these successes on the UNL website
- Disseminate press releases recognizing the successes

<u>Leaders in Making it Happen</u>

In order to move forward with the creation of an entrepreneurship culture at UNL, there must be some faculty who are committed to making it happen. The following list of possibilities is based on short meetings with the faculty listed in previous sections of this report, and there may be others who are equally enthusiastic about entrepreneurship; however, of those with whom I interacted the following stood out above the rest:

Economics/Business:

- Paulo Gomes
- Daved Barry

Social Sciences and Humanities:

- Luis Baptista, Sub-Director, Social Sciences and Humanities
- Salwa Castelo-Branco, Coordinator of INET (music research team)
- Nazaré Roca, Coordinator of E-Geo (geography research unit)

FCT:

- Susana Barreiros – Chemistry Department
- Adolfo Steiger-Garcao – Electrical Engineering and Madan Park
- Celia Costa Cabral - Applied Social Sciences, Economics and Management

- Nuno Cachadinha - Civil Engineering Department

ITQB/IBET:

- Manuel Jose Teixeira Carrondo, Prof. Chemical and Biological Engineering, CEO, IBET

References

Studies

Entrepreneurship in Higher Education, Especially within Non-Business Studies, European Commission, March 2008

The New Inventors – How users are changing the rules of innovation
Research report of the National Endowment for Science, Technology and the Arts, July 2008

The Future Face of Enterprise, edited by Shawnee Keck and Alessandra Buonfino, Collection 26, DEMOS, 2008

Papers and Articles

Commentary on Innovation, William Destler, Nature, June, 2008

The University of Maryland's VentureAccelerator," Proceedings of the American Society for Engineering Education Annual Conference and Exhibition, Honolulu, HI, June 2007, Scott Laughlin, Scott Magids, David F. Barbe

"Bringing Student Innovations to Market: A Hinman CEOs Success Story," Proceedings of the American Society for Engineering Education, Chicago, IL, June 2006, James V. Green, Anik Singal, David F. Barbe, and Karen S. Thornton

"Hinman CEOs Student Ventures," Proceedings of the American Society for Engineering Education Annual Conference and Exposition, Portland, OR, June 2005, David Barbe, Karen Thornton, James Green, Tony Casalena, Matt Weinstein, Borna Ghavam, Blake Robertson

"The Development of a Technology Entrepreneurship Culture and Lessons Learned," Proceedings of the American Society for Engineering Education Annual Conference and Exposition, Salt Lake City, UT, June 2004, D.F. Barbe, K.S. Thornton

Books

Blink
Blue Ocean Strategy
Bounce
Built to Last
Closing the Innovation Gap
Crossing the Chasm
Execution
Finding Fertile Ground
Founders at Work
Good to Great
Hiring the Best
How Breakthroughs Happen
Jump Start Your Business Brain – the Scientific way to Make Money
Marketing High Technology

My Startup Life
New Venture Strategies
No Man's Land
Product Strategy
The Art of Innovation
The Art of the Start
The Balanced Scorecard
The E-Myth Revisited
The Engine of America
The Five Dysfunctions of a Team
The Free Market Innovation Machine
The Goal
The Leadership Challenge: How to Keep Getting Extraordinary Things Done in Organizations
The Tipping Point

Appendix I. Internet Links to Successful Programs and Activities at other Institutions

- Entrepreneurship centers
  - Examples:
    - The Centre for Scientific Enterprise Ltd. (CSEL) (http://www.cselondon.com/)
    - University of Strathclyde Hunter Centre for Entrepreneurship (http://www.entrepreneur.strath.ac.uk/)
    - University of Maryland (http://www.mtech.umd.edu)
    - University of Twente Dutch Institute for Knowledge Intensive Entrepreneurship -NIKOS (http://www.utwente.nl/nikos/)
    - Florida International University Global Entrepreneurship Center (http://www.entrepreneurship.fiu.edu/index.htm)
    - Stanford Technology Ventures Program (STVP) (http://stvp.stanford.edu/)
- Courses
  - Examples:
    - University of Strathclyde undergraduate classes (http://www.entrepreneur.strath.ac.uk/undergrad/)
    - University of Maryland (http://www.mtechventures.umd.edu/education/courses/)
- Product Design and Entrepreneurship
  - Examples:
    - University of Strathclyde (http://www.dmem.strath.ac.uk/Courses/PDE/index.htm)
    - Lehigh University Integrated Product Design (IPD) Program (http://www.lehigh.edu/ipd/)
    - Colorado Integrated Teaching and Learning Program (ITLL) (http://itll.colorado.edu/GEEN3400/)
- Workshops
  - Examples:
    - Create Switzerland VentureLab (http://www.venturelab.ch/dt/home.asp)
    - The National Collegiate Inventors and Innovators Alliance (NCIIA) Invention-to-Venture (I2V) workshops (http://www.invention2venture.org/) modeled after the University of Maryland Technology Startup Boot Camp (http://www.bootcamp.umd.edu/)

- Mentoring and internship programs
  - Examples:
    - Center for Scientific Enterprise (CSEL) (http://www.cselondon.com/)
    -
    - University of Maryland Hinman CEOs Program (http://www.hinmanceos.umd.edu/)
    -
    - Dartmouth College Entrepreneurial Network (DEN) (http://www.den.dartmouth.edu/index.htm) (http://www.den.dartmouth.edu/involved/index.htm)

- Competitions
  - Examples:
    - Center for Scientific Enterprise (CSEL) Entrepreneurs' Challenge (http://www.londonentrepreneurschallenge.com/)
    - University of Texas – Austin Invention-to-Product (I2P) competition (http://www.ideatoproduct.org/)
    - University of Maryland annual $50K business plan competition (http://www.bpc.umd.edu/archive.html)
- Seminar series
  - Examples:
    - Stanford University Thought Leaders Seminar Series (http://etl.stanford.edu/)
    - MIT Innovation and Entrepreneurship Seminar Series (http://web.mit.edu/iandeseminar/)
- Networking
  - Examples:
    - University of Strathclyde Entrepreneurial Network (http://www.e-sen.co.uk/about/)
    - Center for Scientific Enterprise (CSEL) Networking Events (http://www.cselondon.com/technologynetworkingevents.htm)
    - Carnegie Mellon University Undergraduate Entrepreneurship Association (http://www.andrew.cmu.edu/user/uea/)

- Entrepreneurship office hours
  - Example:
    - University of Maryland Mtech Programs (http://www.mtechventures.umd.edu/venture_creation/EOH/)

- General use biotech facility
  - Example
    - University of Maryland biotech scaleup facility (http://www.biotech.umd.edu/BSF.html)

- Accelerator and Incubator
  - Examples:
    (http://www.va.umd.edu/)
    (http://www.tap.umd.edu/)

- Degree minors
  - Example:
    - Penn State University (http://www.e-ship.psu.edu/)

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Annex 2.2
Programmes and courses according to Bologna

ANNEX 2.2 PROGRAMMES AND COURSES ACCORDING TO BOLOGNA

FCT

1st Cycle

Cell and Molecular Biology
Biochemistry
Conservation - Restoration
Materials Engineering
Geological Engineering
Computer Science
Mathematics
Applied Chemistry
Nature Sciences
Telecommunications and Computer Engineering

2nd Cycle - Master Degrees

Glass Art and Science
Bioorganic
Structural and Functional Biochemistry
Biotechnology
Conservation Sciences
Conservation and Restoration
Energy and Bioenergy
Renewable Energy – Electrical Conversion and Sustainable Use
Civil Engineering (Structures and Geotechnics)
Civil Engineering (Building Rehabilitation)
Materials Engineering
Water Management and Engineering
Industrial Engineering and Management
Electrical, Systems and Computer Engineering
Geological Engineering (Georesources)
Geological Engineering (Geotechnics)
Industrial Engineering
Computer Science
Mechanical Engineering
Microelectronics Engineering and Nanotechnologies
Mathematics Education
Biology and Geology Education
Physics and Chemistry Education
Molecular Genetics and Biomedicine
History and Heritage of Science, Technology and Innovation
Computational Logic – European Master Programme supported by Erasmus Mundus
Mathematics and Applications
Food Technology and Safety
Welding Engineering

1st and 2nd Cycle - Master Degrees (Integrated Studies Cycles)

Biomedical Engineering
Environmental Engineering
Electrical and Computer Engineering
Physics Engineering
Chemical and Biochemical Engineering

3rd Cycle - PhD Degrees

Electrical and Computer Engineering
Bioengineering (MIT)
Educational Sciences
Geological Engineering
Civil Engineering

Geology
History, Philosophy and Heritage of Science and Technology
Computer Science
Nanotechnologies and Nanosciences
Industrial Engineering
Mechanical Engineering
Science and Materials Engineering
Mathematics

FCSH

1st Cycle

Anthropology
Archaeology
Political Sciences and International Relations
Communication Sciences
Language Sciences
Musicology
Portuguese and Lusophone Studies
Philosophy
Geography and Regional Planning
History
History of Art
Languages, Literatures and Cultures
Sociology
Translation

2nd Cycle – Master Degrees

Anthropology
Archaeology
Musical Arts
Political Sciences and International Relations
Communication Sciences
Educational Sciences
Information and Documentation Sciences
Language Sciences
Musicology
Child Language Development and Desorders
Human Ecology and Contemporary Social Problems
Editing and Publishing
Teaching Musical Education in Basic Education
Teaching Philosophy in Secondary Education
History and Geography Teaching
Teaching English as a Second or Foreign Language
English Instruction
Teaching Portuguese as a Second and Foreign Language
Portuguese and Classical Languages or Foreigner Languages Teaching
Contemporary German Culture Studies
Portuguese Studies
Women's Studies. Women in Society and Culture
Philosophy
E-learning Systems Management
Geography: Territorial Management
History
History of Art
Journalism
Languages, Literatures and Cultures
Migration, Inter-ethnicities and Transnacionalism
Museology
New *Media* and Web Practises
Heritage Studies
Cultural Practices for Municipalities
Sociology

Terminology of Specialised Information Management
Translation
Crossways in European Humanities (Erasmus Mundus)

3rd Cycle – PhD Degrees
Anthropology
Communication Sciences
Musicology
History
Sociology

FE

1st Cycle
Economics
Management

2nd Cycle – Master Degrees
Economics
Finance
Management
Economics Research
Finance Research
Corporate Strategy
Human Resources Management
Marketing
CEMS MIM – Masters in International Management*
MBA Católica-NOVA*
The Lisbon MBA*

3rd Cycle – PhD Degrees
Economics
Finance
Management

FCM

1st and 2nd Cycle - Integrated Master Degrees (5+1 years)
Medicine

2nd Cycle - Master Degrees
Physiotherapy (jointly with ENSP)
Health and Ageing (jointly with ENSP)
Mental Health Policies and Services
Respiratory Apparatus and Health

3rd Cycle - PhD Degrees
Medicine
Life Sciences*

FD
1st Cycle
Law

2nd Cycle - Master Degrees
Law

3rd Cycle - PhD Degrees
Law

Law (jointly with ISCTEM, Mozambique)
Law (jointly with UAN, Angola)

ISEGI

1st Cycle

Information Management
Systems and Information Technology
Statistics and Information Management*

2nd Cycle – Master Degrees

Geographical Information Systems & Science (e-learning)
Statistics and Information Management
European Master of Science in Information Systems Management
Information Management
Geospatial Technologies (Erasmus Mundus)

3rd Cycle – PhD Degrees

Statistics and Information Management

ITQB

3rd Cycle – PhD Degrees

Chemical and Biological Sciences & Engineering

IHMT

2nd Cycle – Master Degrees

Biomedical Sciences
Tropical Health
Medical Microbiology (jointly with ITQB and FCM)
Medical Parasitology
Health and Development

3rd Cycle – PhD Degrees

Cellular and Molecular Biology*
Microbiology*
Parasitology*
Clinical and Pathology of Tropical Diseases*
International Health*

ENSP

2nd Cycle - Master Degrees

Physiotherapy (jointly with FCM)
Health Management
Public Health
Health and Aging (jointly with FCM)

3rd Cycle - PhD Degrees

Public Health

* - Not adapted to Bologna

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Annex 3.1
Proposed practices for the efficiency of organization and management

ANNEX 3.1 PROPOSED PRACTICES FOR THE EFFICIENCY OF ORGANIZATION AND MANAGEMENT

3.1.1 INTRODUCTION

One of the groups that was set up at the central level has as main objective the analysis of the current and future practices related to the efficiency of organisation and management of UNL and its units. The group is composed by representatives of all AUs.

The group first analysed several guidelines for quality assurance in Higher Education (e.g. national regulations, ENQA standards and guidelines, guidelines issued in the UK, France and Ireland) and concluded that Part C of the 2003 *Handbook of Standards for Quality Management in French Education Institutions* could well be a valuable tool for both the implementation and the self-evaluation of good management practices within UNL.

The working group conducted a self-evaluation exercise based on the French guidelines and on the individual perception each representative had of the respective unit. The general conclusions follow:

- Most of the advisable practices are not implemented;
- Some of the practices are in place, but not in a formal and structured manner;
- In the majority of cases, the performance parameters, indicators and goals are not defined and there are not structured processes to monitor and continuously improve the management practices.

Afterwards, the group analysed in detail each of the French standards and good practices and adapted most of them to the new Portuguese regulations on Higher Education and also to the new statutes of UNL. This resulted in some general recommendations to be followed with regard to strategic matters and in various standards, each one with several examples of good practices. In the opinion of the group, these standards and practices should deserve the best attention within UNL.

A summary of recommendations, standards, and practices are hereafter presented.

3.1.2 GENERAL RECOMMENDATIONS

Vision, Mission, Strategy and Objectives

Good practices in management imply that both the University and its units have a pre-defined Vision, Mission and Strategy for development. The new statutes of UNL already state its Mission and, as soon as the new Rector is elected, the Institution Vision and the strategy to attain it will be issued. The strategy will include the definition of a medium term strategic plan, a four-year plan of action and an annual operational plan.

The same applies to AUs. To secure that the strategies of each of the AUs are aligned with a common strategy of the UNL as a whole, the units should perform a SWOT analysis to diagnose their actual position towards strategic and quality management issues. As mentioned in the self-evaluation report, at present the units are developing their new statutes, after which the new governance and management structures will be established. Only then the units will be able of defining their strategic plans and goals.

Identification of quality practices to ensure a general policy of quality

Ideally, a common system for quality management should be implemented at the UNL. The basis for this system will be the definition of clear quality policy, responsibilities and practices, as well as of specific quality objectives, performance parameters and indicators. Strategic quality objectives, indicators, and short/medium term goals should be part of an operational plan to be unfolded throughout the organisation.

3.1.3 IDENTIFICATION OF STANDARDS AND GOOD PRACTICES

A brief summary of the advisable standards follows, with short references to some of the associated good practices that UNL should implement in the near future.

3.1.3.1 Development Plan

The Strategic Plan defines a medium-term strategy; it defines objectives and includes measures and instruments to monitor results. The Institution produces an annual report, which includes information on the accomplishment of the annual plan and shows how it relates to the four-year term strategic plan; its

execution is both self-evaluated and externally evaluated; it is widely discussed and presented to the councils and distributed within the University.

3.1.3.2 Autonomy

The statutes and regulations constitute the framework for an efficient management of the Institution, by defining the governance bodies, their roles and duties, as well as the reporting lines. Both the University and its units are able to describe any process of decision-making. The Deans of the units should discuss and define the objectives and resources of each department, and establish appropriate methods for their monitoring and assessment.

3.1.3.3 Departments, research structures, and services

The management responsibilities assigned to departments, research structures and services are in full agreement with the Strategic Plan and with the rules relating to the exercise of autonomy – clearly cut missions and duties; a programme of activities aligned with the development plan; regular reports and self-evaluation mechanisms.

3.1.3.4 Partnerships

The Institution has a policy that defines the priorities for developing partnerships (local, regional, national, and international) and actively promotes it. External entities cooperate with the governance and management bodies of the Institution, namely in the accomplishment of the Mission and strategic plan. The Institution fosters the international mobility of academic staff and students. The Institution has tools to monitor and improve the activities in this area, such as: the employment of its former students; scientific partnerships and collaboration of its researchers; areas of synergy and/or competition with other institutions; the quality of integration of foreign students and researchers.

3.1.3.5 Human resources management

The Institution has a policy for the management of human resources, which includes staff integration, career planning, skills development, and training. Policies related to staff welfare and to Occupational Health and Safety exist. Recruitment is adequately planned and obeys to the national regulations for contracting. The Institution has a structure that is responsible for the management of human resources. The SIADAP (Integrated System for Performance Evaluation of Public Administration) is applied to set up the individual goals, aligned with the Institution objectives, and to yearly evaluate the performance of administrative staff. Responsibilities and empowerment are clearly defined. A report on Human Resources management is produced every year.

3.1.3.6 Financial management

The budgeting follows a defined procedure that is aligned with the strategic and annual plans. The Institution has the necessary means to apply its financial policy. There is a clearly cup separation between finance and accounting. The approach for internal distribution of resources is transparent and rules exist for internal invoicing. The budget is duly monitored and financial audits are regularly performed.

3.1.3.7 Information systems and logistics

The Institution has coordinated information systems to provide strategic information. The Institution has an ICT (Information and Communication Technologies) policy, fosters the ICT use, and develops proceedings to ensure data validation and security.

The University has a structure that produces surveys about student's life, which are published within and outside the Institution.

The Institution has an estates assets policy. It is aware of its estates assets and has a plan to protect, restore or restructuring them. There is a department/service with responsibility over the construction and restoration. The maintenance operations are planned in advance.

There is a policy related to the cultural and scientific heritage of the Institution. The cultural and scientific assets are identified, conserved, valorised, and developed.

The Institution has rules to regulate the use of its premises and monitors the use of the public premises.

3.1.4 PARAMETERS AND INDICATORS TO MONITOR GOOD PRACTICES

The working group concluded that most of the information necessary to monitor good practices exists and is being registered, but is mostly spread out among different departments and services in each of the Faculties and Institutes. A minimum core of indicators has been produced yearly and sent to the central services at the Rectorate to become part of the University annual reports.

The group is now working on the establishment of a set of performance parameters, which are intended to be common to all the units:

- Structural parameters (Human Resources; Students)
- Financial parameters (Budget; Income; Expenditure)
- Productivity parameters (Academic; Scientific; External relations)

Once the parameters are fully set up, the group will define the corresponding indicators, which should later be monitored to ascertain and improve the performance of the Institution.

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Annex 3.2
Template for self-evaluation report on teaching

ANNEX 3.2 TEMPLATE FOR SELF-EVALUATION REPORT ON TEACHING

Assignment: In order to integrate the self-evaluation report of the UNL each academic unit should produce a short self-report. These are some guidelines to support the task.

Attention:
The report must be:

- Self-critical and analytical rather than descriptive;
- Focusing on change and development already introduced and for the future (including priorities);
- Supported by existing documentation.

3.2.1 INSTITUTIONAL CONTEXT IN WHAT CONCERNS TEACHING AND LEARNING

- Mission, goals and objectives [1]

It is important to bear in mind that the goals and objectives should relate to the type of student that the institution's programs hope to attract, the training environment the programs wish to create and the product the programs intend to generate.

- Institutional strategy

Training environment and learning resources as well as student support strategies: course work, time at laboratory bench, field work, seminars, observation of professional conducts, professional practice…;

3.2.2 THE STUDENTS

3.2.2.1 Students Admission

- Admission grades, average grade's admission (percentage of vacancies and ratio of applicants admitted, the percentage of students admitted into the first option);
- Profile of the student population (age, gender, socio and cultural environment).

3.2.2.2 Student progression and success rates

- Progression and completion rate, student attainment.

3.2.2.3 The Graduation

- Data on the graduation (students who completed the degree, percentage of dropouts);
- Data on the students' awards;
- Employability of graduates (percentage of students with jobs after finishing the degree, the average time to obtain employment after finishing the degree);
- Criteria for admitting applicants of post-graduation.

3.2.3 QUALITY PROCEDURES (Institutional mechanisms to ensure quality and methodologies used)

3.2.3.1 Approval, monitoring and review of programs and awards

- Mechanisms;
- Who does what;
- Reports and Data gathering, (surveys of students, surveys of faculty, self-evaluation questionnaires, focus groups).

3.2.3.2 Control of student progress and performance

Monitoring of student performance to ensure standards are maintained and to identify when intervention may be necessary to convert problems on the part of the student.

- What strategies and procedures;
- What kind of work is required from the students;

[1] Individual institutions have different missions and goals and objectives. Objectives should be presented **within the context of an institution's own aims.**

- Existence of internal and external monitoring and, if so, what kind of feedback and repercussions.

3.2.4 DEGREE OF SATISFACTION (STUDENTS AND TEACHERS)

- Perceptions about the quality of teaching and learning processes, as well as about:
  Support (tutoring, mentoring, supervision …);
  Guidance for careers (mentors, advisors etc);
- Perceptions about the services for supporting the learning process (library and information technology, equipment, facilities…).

3.2.5 EXISTENCE OF A MANAGEMENT SYSTEM AND QUALITY ASSURANCE TO SYSTEMATIZE THE INFORMATION AND EVIDENCE ON:

- Any system created to identify indicators of success – both statistical indicators and qualitative considerations (keeping in mind what the program is trying to achieve);
- Teaching techniques/methods/strategies used;
- The existence and use of specialized resources to support the teaching and learning processes;
- Teachers' recruitment mechanisms (recruiting who best accommodate the institution's mission, for example) and staff development strategies (training to improve the pedagogical process, mentorship, peer observation…);
- Use of national and international benchmarking;
- Involvement of external observers in corrective actions after the feedback received;
- After identifying areas where success is not being achieved, how is change implemented?

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Annex 3.3
Teaching quality assessment and management framework

ANNEX 3.3 TEACHING QUALITY ASSESSMENT AND MANAGEMENT FRAMEWORK

The design of a quality management device entails several definitions at the institutional level, including a common core for the whole UNL and developments that are specific to each AU:

1. How is quality to be described and measured, regarding framework conditions, resource inputs, processes and outcome performance?
    a. Background definitions of concepts;
    b. Operational definitions of concepts: descriptors and indicators (data to be collected);
    c. Definition of relevant units for data collection, in view of the intended units of analysis (e.g. in assessments by students, should analysis be discipline-based, class-based, teacher-based? Which are the relevant "asking" units to provide the raw data for the desired aggregations?);
    d. Design of data collection tools (administrative data, surveys, focus groups ...);
    e. Definition of data processing routines to arrive at comparable descriptions and measurements;
    f. Design of a common information system for data storage and retrieval;
    g. Definition of a schedule for routine data collection, processing and reporting.
    h. Definition of an implementation schedule over the next few (e.g. three?) years.

2. Who is to collect and process descriptive and measurement data?

3. How and by whom are descriptions and measures to be assessed?
    a. Definition of quality benchmarks at UNL and AU levels (how and by whom? With which terms of reference?);
    b. Definition of information-sharing and reporting routines (who are which results reported to?);
    c. Definition of interpretation and evaluation routines (what are the procedures to discuss the findings, which actors do they involve for each benchmarking theme?);
    d. Which actors will sum up and report the findings in c. (highlight the strengths and weaknesses across the board, summarize the evaluations by the relevant actors, collect and systematize the suggestions emerging from the discussion)?

4. What is the policy for dissemination of results?
    a. Definition of what information is to be disseminated within which boundaries (form public access information to restricted access publics); b. Creation of a dissemination routine and a reporting schedule.

5. How will assessment results feed back into the decision process?
    a. Creation of planning and decision-making routines and schedules by the competent directive bodies that explicit1y incorporate the analysis of reported findings and suggestions, and the corresponding policy measures;
    b. Explicit inclusion of the analysis of assessment findings and suggestions, the rationale linking them to the planned measures, and the

implementation of the measures themselves in the reports of the relevant directive bodies.

6. How do assessment results and suggestions feed back into the performance assessment of relevant actors, and with what consequences?
    a. Creation of protocols for access to assessment data at different levels of aggregation (who has access to which assessment information about what/whom? E.g. who will have access to discipline-level or teacher-level assessment results?);
    b. Creation of an ongoing assessment scoreboard summarizing assessment indicators and their evolution at the pertinent levels of (dis-)aggregation and relevant actors (UNL, AU, department, course, discipline, teacher? Need to define politically which actors are to be formally assessed, whose assessment indicators will be made public or circulate within decision-making bodies; e.g. should teachers' assessment scoreboards be made available to juries for tenure and career advancements?);
    c. Creation of explicit procedures for early warning, goal-setting and recommendations by directive bodies to relevant actors, identifying weaknesses and potential for improvement;
    d. Creation of explicit reference to assessment results (and their evolution) in the scoreboard in all activity reports requested of relevant actors (e.g. AU, department; teacher?);
    e. Explicit consideration of assessment results by directive bodies in all decisions involving resource allocation, within the limits and instruments legally feasible (e.g. human resources and teaching time-loads, quotas for sabbaticals in AU and departments, decisions about individual sabbaticals?).

7. Last but definitely not the least, to put in place such a device will require, at the UNL level and at the level of each AU, a professional team with qualified human resources, few of whom full-time. Such teams should be designed and implemented over the next few years, according to the phasing-in of the several components of the assessment process, to be defined above in 1. and 2.

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Annex 3.4

Agreements signed in 2007

LIST OF AGREEMENTS

Agreements signed in 2007 by Universidade Nova de Lisboa

PARTNER	COOPERATION AREA	SIGNATURE DATE
UTAustin - Portugal Programme	International Cooperation in Science, Technology and Higher Education in the following areas: Digital Media, Advanced Computing and Mathematics.	02-03-2007
CIEE - Council on International Educational Exchange, USA	Incoming American students.	02-05-2007
Contract between UNL and YDreams	Space provided for the construction of facilities, for a period of 10 years.	28-05-2007
Universidade do Porto	PhD programme.	12-06-2007
Universidade do Algarve	Scientific, technical and pedagogical cooperation.	06-07-2007
Agreement with PUC Minas Gerais	Interchange programmes and academic collaboration.	11-07-2007
Universidade de Aveiro and Universidade do Minho	Establishes a framework for the operation of the I3N Associated Laboratory.	27-07-2007
Universidade Católica de Moçambique	Cooperation in the research and training fields.	17-09-2007
Valormed	Interaction in areas related with the environmental impact of the activities developed by Valormed.	12-10-2007
Cooperation Agreement with the Portuguese Army	It regulates the use of a section of the building at Av. de Berna - 26 by UNL.	30-10-2007
Cooperation Agreement with *Fundação para a Computação Científica Nacional* under the scope of the b-on initiative (online knowledge library).	Regulates the electronic access to the resources available in the Knowledge Library (b-on).	15-10-2007
Regulations - Support to Scholarship holders / *Santander Totta* Scholarship - *Universidade Nova de Lisboa*	Support conditions provided by the *Santander Totta* Bank to scholarship holders.	21-11-2007
Universidade de Lisboa	Cooperation activities that strengthen the mutual interests of both institutions, namely in the undergraduate and graduate training.	22-11-2007
Pulido Valente Hospital EPE - Cooperation agreement between the teaching and research areas and the medical activity	It defines the cooperation conditions between the teaching and research activities promoted by FCM-UNL and the medical activity developed by HPV EPE.	30-11-2007
Universidade Estadual de Campinas	Areas of mutual interest: interchanges, implementation of common projects, promotion of scientific and cultural events.	07-12-2007

Universidade Federal da Paraíba	Students and teachers interchange at graduate and post-graduate level	20-12-2007
Pontifícia Universidade Católica do Paraná	Creation of a technological, cultural and scientific interchange and cooperation programme.	20-12-2007
Universidade Estadual de Montes Claros	Interchange of students, teachers, researchers and non-teaching staff and organization of conferences and other events.	20-12-2007
UNESP-Universidade Estadual Paulista "Júlio Mesquita Filho"	Student Interchange (Santander Universidades)	27-06-2007
Universidade de Brasília	Student Interchange (Santander Universidades)	02-07-2007
Universidade Federal de Pernambuco	Student Interchange (Santander Universidades)	30-07-2007
Universidade Federal de Santa Catarina	Student Interchange (Santander Universidades)	11-07-2007
Universidade Federal de Santa Maria	Student Interchange (Santander Universidades)	02-07-2007
Universidade Federal do Piauí	Student Interchange (Santander Universidades)	19-07-2007
Universidade Federal do Rio Grande do Norte	Student Interchange (Santander Universidades)	27-09-2007

Agreements signed by the Academic Units

PARTNER	COOPERATION AREA	SIGNATURE DATE
FCT, ITQB, IBET and IGC Agreement	Scientific cooperation under the scope of the agreement between MIT and the Portuguese government.	30-04-2007
Cooperation agreement between FCSH and IPRI	Cooperation framework for the creation of joint activities.	06-06-2007
FCT, ITQB and IBET Agreement	Establishes the cooperation conditions for the 2nd and 3rd cycles of the common areas.	08-06-2007
Cooperation agreement between ISEGI and Universidade de Cabo Verde	Aims at strengthening the cooperation and interchange in order to promote collaboration actions in the activity fields in which the institutions are involved.	24-09-2007

Cooperation agreement between MIT, FCT, IST and Universidade Minho	Promote the collaboration in fields of common interest, in order to jointly organize the post-graduate teaching programmes in the Bioengineering Systems area.	10-10-2007
Cooperation agreement between FCT and YDreams	Joint projects and knowledge transfer. Ownership and intellectual property rights of prototypes and resulting products in the consortium.	Ratified on 12-10-2007

CRUP (Portuguese Universities Rectors' Council) Agreements

PARTNER	COOPERATION AREA	SIGNATURE DATE
Agreement for the creation of the *Santander Universidades* Luso-Brazilian Grants between CRUP, ANDIFES and CRUESP	Student interchange	20-01-2007
ParisTech / CRUP	Scientific and academic cooperation.	16-07-2007

UNIVERSIDADE NOVA DE LISBOA

Self-Evaluation Report

January 2009

Annex 5.1

Book of abstracts of the

Workshop Ciência 2007

Workshop *Ciência 2007*

Book of Abstracts

Universidade Nova de Lisboa

Rectorate, 28th October 2008

Organizing Committee

Maria Arménia Carrondo, UNL

Teresa Cidade, FCT

António Marques, FCSH

Cristina Silva Pereira, ITQB

Manolis Matzapetakis, ITQB

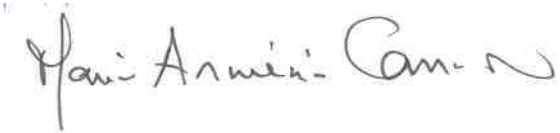
Ana Ramos Falcão, UNL

Foreword

The researchers appointed under the *Ciência 2007* initiative will play a decisive role in the reinforcement of UNL competitiveness and its visibility in our country and abroad. These 69 researchers were selected on the basis of their potential and the quality of their proposal and *curriculum*, following international calls. Almost half of them are non Portuguese, originating from 17 different countries; 25% obtained their PhD degree at UNL, 19% in other Portuguese Universities and the remainder at other Universities across the globe.

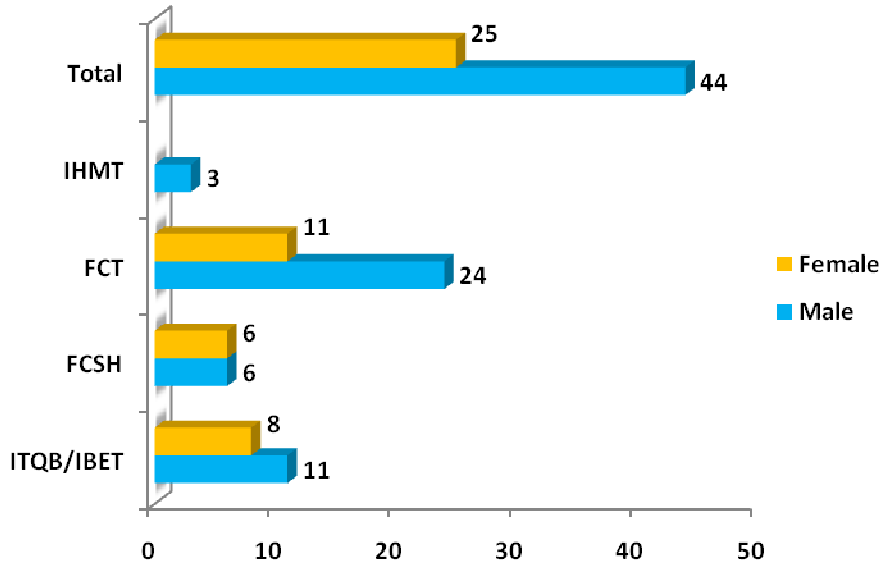
As the host institution, our job is to provide the conditions required for the accomplishing of an outstanding scientific career. To fulfill this goal, applications to projects of national and international funding agencies are strongly encouraged. Particular attention should be given to the European Research Council starting grants that support individual research leaders in all fields, including the social sciences and humanities, with scientific excellence as the sole criterion. The ERC funds give preference to “frontier research", the pursuit of questions at or beyond the frontiers of knowledge, without regard for established disciplinary boundaries.

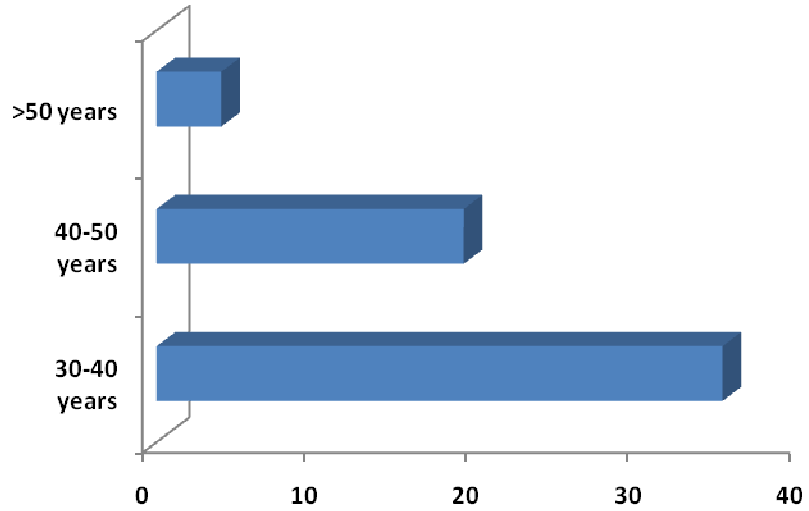
This culture of interdisciplinarity is an objective to be developed and nurtured at UNL as part of the strategic policy of our present Rector. I hope that this workshop will constitute an opportunity to identify synergies across scientific areas, promote collaborations between the different faculties/institutes/school, and eventually trigger pioneering projects and unconventional, innovative approaches.



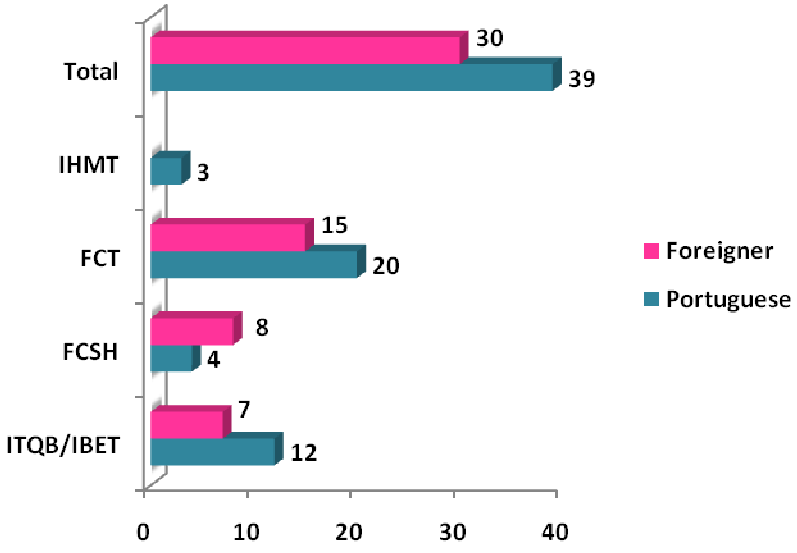
Maria Arménia Carrondo
Vice-Rector for Research and International Relations

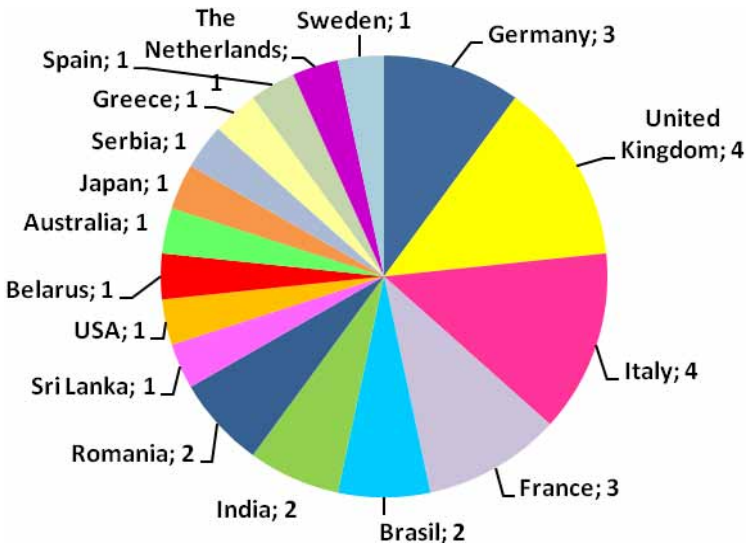
Ciência 2007 Researchers. Distribution by gender and age



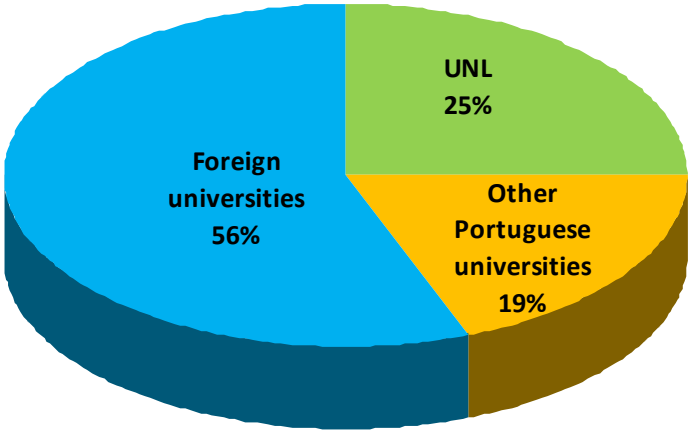


Ciência 2007 Researchers. Nationality





Ciência 2007 Researchers. Institution where the doctoral degree was obtained



PROGRAMME

Programa Ciência 2007 - Relevance for the Institutions and the Researchers

Chair : Prof. António Rendas

9.00–09.10h I Welcome address, António Rendas, Rector of Universidade Nova de Lisboa

9.10–09.30h I João Sentieiro, President of Fundação para a Ciência e a Tecnologia

9.30–09.50h I Elvira Fortunato, Representative of the Coordinators of the Research Centres, Faculdade de Ciências e Tecnologia, FCT

9.50–10.10h I António Marques, President of the Scientific Council, Faculdade de Ciências Sociais e Humanas, FCSH

10.10–10.30h I Luís Paulo Rebelo, Vice-Director of Instituto de Tecnologia Química e Biológica, ITQB

10.30–10.50h I Maria Amélia Grácio, President of the Scientific Council, Instituto de Higiene e Medicina Tropical, IHMT

10.50–13.00h I Coffee-break I **Poster Session**

Chair: Prof. António Marques

14.30 – 15.15h I **FCT Researchers**

Susana Sério, CEFITEC
Gallolu Senadeera, CENIMAT/I3N,
João Cortez, CQFB/REQUIMTE

15.15 – 15.45h I **FCSH Researchers**

Gabriele De Angelis, IFL
Maria Alexandra Melo, CLUNL
Gabriela Cruz, CESEM

15.45– 16.15h I **ITQB Researchers,** video presented by Ana Sanchez, External Relations, ITQB

16.15 – 16.30h I **IHMT Researcher**, João Rodrigues

16.30 – 17.15h I Coffee-break I **Poster Session**

17.15 – 18.30h I

Round-table discussion on Ciência 2007 Perceptions, Expectations and Future

Maria Arménia Carrondo, Vice-Rector for Research, UNL, coordinator
João Sentieiro, President of Fundação para a Ciência e a Tecnologia
João Paulo Crespo, President of the Scientific Council, FCT
Maria Ascensão Reis, Vice-President of the Scientific Council, FCT
João Paulo Oliveira e Costa, Coordinator, Centro de História de Além-Mar, FCSH
Jessica Hallet, Researcher, Centro de História de Além-Mar, FCSH
José Artur Martinho Simões, Director, ITQB
Nelson Saibo, Researcher, ITQB
Maria Amélia Grácio, President of the Scientific Council, IHMT
Virgílio do Rosário, Director of Malaria Unit, IHMT
Carla Nunes, Vice-President of the Scientific Council, ENSP

Name – Scientific area – UNL unit

Maria Gabriela M. de Almeida – Biochemistry – REQUIMTE/FCT

Maria Antónia P. de Almeida – History of Science and Technology – CHFCT/FCT

Gabriele de Angelis – Political Theory – IFL/FCSH

Yann Astier – Chemistry - ITQB

Tiago Bandeiras – Structure-based Drug Design - ITQB

Isabel Bento – Structural Biology - ITQB

Andreas Bohn – Biology - ITQB

Nuno Borges – Microbiology - ITQB

Luís Branco – Photochemistry and Supramolecular Chemistry – REQUIMTE/FCT

Tomas By – Natural Language Processing – CLUNL/FCSH

Marta Carepo – Biochemistry – REQUIMTE-CQFB/FCT

Angelo Cattaneo – History of Science – CHAM/FCSH

Martim Chichorro – Geosciences – CICEGe/FCT

João Cortez – Nanotechnology - REQUIMTE-CQFB/FCT

Gabriela Cruz – Musicology – CESEM/FCSH

Davide D'Alimonte – Satellite Oceanography – CENTRIA/FCT

Pedro Domingos – Neurobiology - ITQB

Maria de Deus Duarte – Anglo-Portuguese Studies – CEAP/FCSH

Catarina Duarte – Particles and Biomaterials Processing - ITQB

José Esperança – Chemistry - ITQB

António Ferreira – Geosciences – CICEGe/FCT

Sergej Filonovich – Material Sciences – CENIMAT-I3N/FCT

Patrick Groves –Structural Biology - ITQB

Jessica Hallett –Art History – CHAM/FCSH

Tamito Kajiyama –Computer Sciences – CITI/FCT

Nuno Leal – Earth Sciences – CICEGe/FCT

Franck Lihoreau – Philosophy – IFL/FCSH

Karimbi Mahesh – Shape Memory Effect – CENIMAT-I3N/FCT

Isabel Marrucho – Ionic Liquids for Chemical and Biological Processes - ITQB

Manolis Matzapetakis – Biomolecular NMR, Structural Biology - ITQB

Maria Alexandra Fiéis e Melo – Linguistics – CLUNL/FCSH

Tiago Miranda – History – CHAM/FCSH

Luís Jaime Mota – Biology - ITQB

Bernadette Nelson – Music – CESEM/FCSH

Rui Neves – Science Education and Computational Modelling – UIED/FCT

Duarte Oliveira – Microbiology – CREM/FCT

Florbela Sá Pereira – Chemistry - REQUIMTE-CQFB/FCT

Cristina Silva Pereira – Applied and Environmental Mycology - ITQB

Carlos Queiroz – Chemistry – VICARTE/FCT

Erich Rast – Philosophy – IFL/FCSH

Celso Ribeiro – Physics, Chemistry, Biomedicine, Engineering – CEFITEC/FCT

João Rodrigues – Proteomics and functional genomics – CMDT-LA/IHMT

Nuno Rolão – Immunology/Clinical Studies - CMDT-LA/IHMT

Célia Romão – Structural Biology of Metalloproteins/Metabollomics - ITQB

Marta Rosales – Anthropology – CRIA/FCSH

Maria Helena de Sá – Physics – CEFITEC/FCT

Nelson Saibo – Plant Sciences - ITQB

Irina Sandu – Conservation and Restoration of Paintings – DCR/FCT

Pedro Sanguino – Materials Technology – CEFITEC/FCT

Dirk-Jan Scheffers – Bacterial Membrane Proteomics - ITQB

Gallolu Senadeera – Hybrid Solar Cells – CENIMAT-I3N/FCT

Margarida Moreira dos Santos – Bionanotechnology – CIGMH-Pólo1/FCT

Susana Sério – Technology – CEFITEC/FCT

Bruno Cecílio de Sousa – Biostatistics - CMDT-LA/IHMT

Patrícia Paes de Sousa – Biochemistry - REQUIMTE-CQFB/FCT

Cristina Timóteo – Biochemistry - REQUIMTE-CQFB/FCT

Smilja Todorovic – Biophysical Chemistry - ITQB

Wagner Valente – Education – UIED/FCT

Alain Véron – Physics of Soft Materials - CENIMAT-I3N/FCT

Abstracts

NAME: M. Gabriela Almeida
UNIT: REQUIMTE, CQFB
EMAIL: mga@dq.fct.unl.pt
MAIN SCIENTIFIC AREA:
Biochemistry

Exploring Bacterial Oxidoreductases to Develop Amperometric Biosensors

In recent years, there has been a budding increase in the social and political awareness of the need for monitoring and controlling of clinical, environmental and industrial activities. The output of such analytical surveillance should help in decision making, regarding safety and protection. This implies the use of diagnostic tools able to give a high selective and sensitive response within a short period of time. In this context, the development of **biosensors** devices - which result from the conjugation of biological and transducer components in an integrated and monolithic fashion - constitutes a very important area of R&D. The construction of electrochemical biosensors based on electron transfer enzymes in particular, is a very active field due to the high analytical performance usual shown, associated to their low cost and small dimensions.

The aim of my project is the production of enzyme based biosensors for the amperometric quantification of their substrates in complex samples. As biological components for the recognition of the target analytes, I am exploring redox enzymes isolated from bacterial sources such as nitrite and sulfite reductases from the sulfate reducer *Desulfovibrio desulfuricans* ATCC 27774. Several enzyme immobilizing strategies and electrode configurations are being tested to optimize signal intensity and stability and to modulate the diffusional parameters.

NAME: Maria Antónia Pires de Almeida
UNIT: Centro de História e Filosofia da Ciência e da Tecnologia, FCT, UNL
EMAIL: map.almeida@fct.unl.pt
MAIN SCIENTIFIC AREA: History of Science and Technology

History of the Popularization of Science and Technology in Portugal

With the ultimate goal of producing a History of the Popularization of Science and Technology in Portugal, this project aims to find out how scientific knowledge reached the common people. The period of research is the nineteenth century and early twentieth. Keeping in mind the population's limited access to written material, nevertheless we use newspapers as our main source of research. Considering that daily each newspaper could be read by or read to about 30.000 people in Lisbon (this figure is estimated by *Diário de Notícias* in 1865), this was probably the most widespread vehicle to divulge the latest scientific news at the time to an unspecialised audience. Therefore we chose mainstream newspapers like Lisbon's *O Século* and *Diário de Notícias* and *Comércio do Porto* whose purposes were to be of interest to all classes, accessible to all purses and understood by every level of intelligence. Our research focuses on collecting news and advertisements that reveal the scientific knowledge of the time. During these first nine months working at the National Library, I've constructed a data base which, at present, has about 2.500 files. After an accurate treatment, all this material shall provide the necessary information to produce papers and possible articles to be published in international journals subject to peer review. The main themes I am working on right now are: «The 1853-1856 cholera morbus epidemic as seen by the press»; «Nineteenth century scientific and technological advertisements».

NAME: **Gabriele de Angelis**
UNIT: **IFL**
EMAIL: **gabriele.deangelis@fcsh.unl.pt**
MAIN SCIENTIFIC AREA: **Political Theory**

Political Institutions, Political Language, Political Behaviour. A Framework for Political Analysis

Contemporary political theory usually understands political behaviour as a form of strategic behaviour based on interests (individual interest of political actors, group interest, party's interest, etc.), and considers appeals to political ethics as belonging to political rhetoric. As a specific theoretical object, ethics is seen as pertaining to the realm of what ought to be rather than to the realm of what is the case, and is therefore largely excluded from empirical analyses.

Despite the scepticism of current political theory, the reference political language makes to ethical and motivational constructions may be shown as being part of a tacit "grammar" that constitutes the fundamental infrastructure of political communication. The history of political thought reminds us of the importance of rhetorical constructions such as "representation", "the national interest", "the common good", "fairness", "social justice", etc. My research aims to highlight how such exemplary keywords of political rhetoric have to do with the normative frame of political institutions. The theoretical premises of a theory of political behaviour capable of recombining the "tacit ethics" of political institutions with a descriptive account of political phenomena is to be sought both in political theories of the Weimar Republic (Kelsen, Schmitt, Weber, Michels) and in the research tradition on civic and political culture. My research aims at recovering a viable theory of political institutions as well as applying it to the study of social contention and protest movements.

NAME: Yann Yastier
UNIT: ITQB
EMAIL: yannastier@itqb.unl.pt
MAIN SCIENTIFIC AREA: Chemistry

Single Molecule Processes

This new group at ITQB is focussed on the study of chemical and biochemical processes at the single molecule level. Observing a single molecule and its stochastic interactions with another gives a bottom up understanding of bulk chemistry. While bulk chemistry relies on the notion of equilibrium, single molecule processes know no such thing.

We use protein nanopores such as alpha-hemolysin in a single channel electrophysiology set-up. The alpha-hemolysin, with a 1.5 nm diameter at the narrowest part of the pore, is used as an ionic magnifying lens to observe a single molecule trapped inside it.

NAME: Tiago M. Bandeiras
UNIT: ITQB/IBET
EMAIL: tiagob@itqb.unl.pt
MAIN SCIENTIFIC AREA: Protein domain design and production for crystallization; Structure-based drug design

Protein Domain and Structure-based Drug Design

Structure-based drug design is one of the most important tools used by the major pharmaceutical companies in the drug developing process. In this process the three-dimensional structure of a protein validated as drug target interacting with small molecules (inhibitors) is used to guide drug discovery. The structural information obtained with X-ray crystallography allows for the understanding of how the lead compound binds to the pocket of the drug target protein, therefore giving the medicinal chemists the information on how to modify the molecule to obtain the desired properties. Therefore, structure-based drug design approach aims for the production of higher quality molecules, with better pharmacological chemical properties. The production of protein samples for the development of new drugs includes protein domain design, expression, purification, and crystallization, followed by the X-ray structure determination and the necessary data analysis. Protein domain design may overcome difficulties in crystallizing protein targets, especially those who are multi-domain proteins connected by aminoacid-stretches carrying different tasks which are not crystallizable due to inter-domain flexibility. Limited proteolyses is a powerful tool to identify domain borders, which can be used for protein crystallization approaches.

NAME: Isabel Bento
UNIT: ITQB
EMAIL: bento@itqb.unl.pt
MAIN SCIENTIFIC AREA: Structural Biology

INSTITUTO DE TECNOLOGIA QUÍMICA E BIOLÓGICA

X-Ray Structure of Small and Large Molecules

The research is based on the determination of the three dimensional structure of Small and Large Molecules by X-ray Crystallography including the use of synchrotron radiation. Precise structural information at the molecular level is an absolute essential for a proper understanding of the relationships between structure and function. The determination of the three dimensional structure of small molecules is integrated into the Small Molecule Crystallography Service at ITQB. This service is part of the Lisbon Area Small Molecule Structure Determination Service that runs jointly as a National Facility between Instituto de Tecnologia Química e Biológica (ITQB), Instituto Superior Técnico (IST) and Instituto de Tecnologia Química e Nuclear (ITN). The main driving force has been the elucidation of organic and inorganic structures of chemical importance such as liquid crystals and those with chiral properties. With respect to large molecules of biological importance, the main focus is the determination of the molecular basis of enzymatic mechanisms and, in particular, the reduction of dioxygen to water by multi-copper oxidases and the cleavage of glycosidic bonds by glycoside hydrolases. To study the former mechanism a bacterial laccase is mainly utilised as well as the human plasma protein, ceruloplasmin. For the latter, the research is based on a bacterial glycoside hydrolase from the 43 family as a model system.

NAME: Andreas Bohn
UNIT: ITQB
EMAIL: abohn@itqb.unl.pt
MAIN SCIENTIFIC AREA: Biology

Systems Biodynamics – Growth, Cycles, Integration

The Systems Biodynamics Group at ITQB applies quantitative computational tools to study dynamical processes in multi-cellular systems under environmental conditions close to their natural habitats. The primary fields of study are i) growth processes in microbial communities with a photosynthesizing component, the so-called phototrophic biofilms, and ii) the synchronization of systems of biological clocks under the influence of complex environmental signals generating circadian (24h) cycles of plant metabolism and animal behaviour.

The work is based on the perspectives of integrative systems biology: the large-scale objective is to understand the logical principles behind the emergence of organismic function and disease from networks of many components interacting across different scales of biological organization, from the whole organism in its environment to the genome. The pursued methodology attempts to catalyze scientific discovery by integrating experimental work, computational tools for data management and analysis, as well as mathematical modeling and numerical simulation in interdisciplinary research cycles.

The transversal nature of this methodology enables the interaction with a large spectrum of experimental groups, and is currently being realized in a number of collaborations of the group with experimental partners, in particular in applied environmental biosciences and –technology.

NAME: Nuno Borges
UNIT: ITQB
EMAIL: nunob@itqb.unl.pt
MAIN SCIENTIFIC AREA: Microbiology

Assessing the Contribution of Di-*myo*-inositol Phosphate during Stress Adaptation of *Thermococcus kodakaraensis*

Di-*myo*-inositol phosphate (DIP) is the most widespread organic solute in microorganisms adapted to hot environments. Moreover, DIP has never been encountered in organisms with optimal growth temperature below 60ºC. Therefore, it is tempting to speculate that DIP plays a role in the protection of cellular components against heat damage *in vivo*. However, a final answer concerning the contribution of DIP to the mechanism of thermo-adaptation of hyperthermophiles can only be obtained through experiments involving the deletion of the genes involved in its synthesis. With this goal in mind, we selected the hyperthermophilic archaeon *Thermococcus kodakaraensis* as a target organism given the availability of an efficient gene disruption system. *T. kodakaraensis* accumulates DIP as a major solute in response to supraoptimal growth temperature; interestingly, under optimal growth conditions aspartate and glutamate are the major solutes. The gene encoding the key activities for the synthesis of DIP was identified. The gene product is a bifunctional enzyme that catalyses the condensation of CTP with inositol-1-P into CDP-inositol as well as the coupling of CDP-inositol with inositol-1-P into di-*myo*-inositol phosphate phosphate. This gene was deleted by double-crossover recombination and the resulting strain was unable to accumulate DIP. The specific growth rates and the solute accumulation profiles of the mutant and the parent strains have been investigated at different temperatures to evaluate the contribution of DIP to the mechanisms of thermo-adaptation in *T. kodakaraensis*.

NAME: Luis C. Branco
UNIT: FCT-UNL (REQUIMTE)
EMAIL: lbranco@dq.fct.unl.pt
MAIN SCIENTIFIC AREA:
Photochemistry and Supramolecular Chemistry

Ionic Liquids as New Organic Materials

In recent years, Ionic Liquids (ILs), which consist of organic cations and appropriate anions (liquid compounds until 100 ºC) have received much attention due to their potential as an alternative recyclable environmentally benign reaction media for chemical processes. They have intrinsically useful properties, such as thermal stability, high ionic conductivity, negligible vapour pressure and a large electrochemical window. Depending on the anion and cation classes selected, the ILs can solubilise several organic (e.g. pharmaceutical compounds) and inorganic materials (e.g. transition metal complexes), and also some gases (e.g. hydrogen, carbon dioxide) or supercritical fluids (e.g. supercritical CO_2). ILs can be called as “designer solvents” because their physical properties (such as melting point, viscosity, density and hydrophobicity) can be modified according to the nature of the desired application by modification of their cations and anions. Applications of Ionic Liquids include their use as green media for different chemical processes, including bio- and chemical catalysis, gas chromatography, some clean extraction or separation processes, dissolution of cellulose and other important materials, in fuel and solar cells and their potential use as nanomaterials.

Our recent work have consisted into create Task-Specific Ionic Liquids (TSILs) by combination of organic cation units (e.g. imidazolium, ammonium, sulfonium and guanidinium cations) with specific anions (e.g. inorganic and achiral or chiral organic anions) for applications in material science (as liquid crystals or photochromic ionic liquids) and energy (as dye solar cells or lubricants).

NAME: Tomas By
UNIT: CLUNL
EMAIL: tomas.by@fcsh.unl.pt
MAIN SCIENTIFIC AREA: Natural Language Processing

Temporal information in language

In any text in human language, there is a temporal structure of described events, that is mainly expressed by tense, aspect and time adverbials. While it is possible, by using clock times and calendar dates, to indicate the time of the described events unambiguously, time information is most often relative to the preceding text. It is also possible to maintain more than one timeline separately in the same text. For example, a present tense narrative might be interspersed with a decription in the past tense, to contrast the `present' state of affairs with how it was before.

This project attempts to create a computer program that can read a text and interpret the temporal structure, producing a formal representation of the meaning of the text. The input is a representation of the syntactic structure, not raw text. Additionally, some resources, such as a lexicon of formalized verb meanings, have to be created by hand. These things limit the range of texts that can be handled by the system.

NAME: Marta Sofia Peixe Carepo
UNIT: REQUIMTE, CQFB
EMAIL: marta.carepo@dq.fct.unl.pt
MAIN SCIENTIFIC AREA:
Biochemistry

Metalloproteins and Metal Resistance Systems in Bacteria

One third of all proteins require transition metal ions to perform their biological activities. Although often required in trace amounts, suboptimal or toxic concentrations of intracellular metal ions have severe affects on many aspects of cellular metabolism. Metal homeostasis in prokaryotes is maintained by metal-responsive transcriptional regulatory proteins that regulate the transcription of genes encoding proteins responsible for metal detoxification, sequestration, efflux and uptake. The same regulatory mechanisms are used to provide resistance to heavy-metal pollutants including mercury and arsenic.

My research is focused on the study of different bacteria metal resistance systems, mainly arsenic resistance operons and a new molybdenum resistance mechanism recently found in sulfate reducing bacteria. The aim is to biochemically and structurally characterize proteins belonging to these resistance systems as well as study their regulation mechanisms.

Proteins containing new metal clusters with Cu, Mo or Fe are also within the scope of my work with the purpose of understanding their functional role and metal cluster properties.

NAME: Angelo Cattaneo
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Centro de História de Além-Mar
EMAIL: ang.cattaneo@gmail.com
MAIN SCIENTIFIC AREA: History – History of Science

Between Colonialism and Missions: Cultural and Scientific Intermediacy between European and Overseas Civilizations from the Fifteenth to the Eighteenth Centuries. In Quest for Early Modern Global History

This research project focuses on ideas about globalisation and transcultural identities before the industrial revolution. It aims to show that Early Modern European cultures have a long history of engaging in cultural encounters and taking part in early processes of globalisation through the interaction with several Overseas cultures. In the period 1450-1750, within the framework of the European expansion, world-cities such as Lisbon, Antwerp, Venice, Istanbul, Cairo, Alexandria, Baghdad, Aden, Beijing, Seoul, Nagasaki, Manila, Rio de Janeiro (this is just an exemplificative list), all placed at the convergence of composite routes linking West and East, produced impressive cultural attestations of what nowadays is called global cultural history.

The main thrust of this project deals with the study of channels of communication at a global level and the gathering of global information, as part of the broad themes of the world circulation of knowledge and technology and material culture from the fifteenth to the eighteenth centuries.

This research will contribute to building up expertise in global history in a period before the industrial revolution, with particular emphasis to the role played by the Portuguese Empire in the framework of the European expansion. Attention will be particularly consecrated to local contexts of interaction in Africa, South America, China and Japan, avoiding the pitfalls of the notion of Westernization and challenging the old idea of Europe's 'discovery of the world' as well as traditional definitions of the role of European cultural brokerage as an agent of innovation and Westernization.

NAME: Martim Chichorro
UNIT: CICEGe
EMAIL: ma.chichorro@fct.unl.pt
MAIN SCIENTIFIC AREA: Geosciences

Application of geochronology, tectonics/geodynamics, metamorphic geology and geochemistry studies to 4D-Geology Modelling

The obtention of geochronological data from sedimentary, igneous and metamorphic rocks is essential to build up 4D models which are crucial to introduce time constraints to better understand different geological processes. Our research interests are mainly focused on dating zircons with U-Th-Pb isotopic studies to obtain: (1) age of crystallization of igneous rocks, (2) maximum deposition age of sediments, (3) inherited ages for provenances studies, (4) age of metamorphism / hydrothermalism and (5) age of deformation. By analysing the temporal and spatial distribution of such information and through curves of probability distribution of the obtained ages we can improve paleogeographic reconstructions. We apply U-Th-Pb geochronology of zircon with SHRIMP (Sensitive High resolution Íon MicroProbe), the Conventional isotope dilution (IDTIMS) and Laser ablation (LA-ICP-MS). These methods are actually view as the most precise for dating rocks. The selection and the study of the internal morphology of the zircon grains is done with cathodoluminiscence imaging, in order to select the targets for dating.

4D moddeling contributes to improve the knowledge of the subsurface substratum and it is a contribution for scientific, applied and economic studies with social–economic implications. It is fundamental to evaluate urban and territorial organization. 4D models are also important to evaluate geological hazards such as potential natural risks of metal contamination of soil and waters, seismic and volcanic hazardous, rating the risks of erosion, and prospecting new potential areas of underground water-systems, precious and strategic metallic and non-metallic deposits, oil/gas reservoirs and ornamental rocks. With the geochronological data we are also able to do 4D moddeling of: (1) modern and ancient sedimentary basins; (2) stratigraphic correlations; (3) ancient and modern fault zones; (4) geochemical and geophysical anomalies; (5) spatial and temporal variations of mineralizations (essential for reserve calculations);

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BioNanotechnology: bio-inspired nanotools

BioNanotechnology can be broadly defined as “the use of biomolecules for applications in nanotechnology”. Bionanotechnology is a truly interdisciplinary field that thrives at the interface of Nanotechnology and Biotechnology, resulting from the convergence of Physics, Chemistry, Materials Science and Biological Sciences. Advances are foreseen in particular in the fields of Molecular Diagnostics and Therapies, Biosensing, Cell Biology and Materials Science.

The Ciência 2007 Assistant Researcher works within the BioNanotechnology laboratory (CQFB). The main goals of the Fellowship are the development of nanoscale based diagnostic systems for application in Nanomedicine, and of Biosensing strategies and devices. Focus will be directed at the functionalization of metal nanoparticles (gold, silver, magnetic) with DNA and/or specific proteins (e.g. enzymes, antibodies) for diagnostic and sensing purposes. The main applications sought are the characterization and detection of pathogens, cancer and target molecules and toxins, and the development (in partnership with industry and other research centres) of diagnostic kits and detection devices.
Research involves the development of strategies for nanoparticle functionalisation with specific ligands and the more fundamental study of nanoparticle-protein interactions with an array of techniques (e.g. spectroscopy and microscopy methods).

A further aspect of the work being developed is the use of different nanoparticles to modify the properties of materials such as textile fibres and biocomposites.

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Opera, Culture of the Ephemeral

My research centers on opera and nineteenth-century musical culture. Opera, an extravagant art, is also an ephemeral one, entirely dependent on stage-phenomena. This is a condition which traditional musicology does not address. My research on performance issues and on opera as performance concerns two aspects which I have been pursuing under different institutional frameworks. I am part of an international, interdisciplinary scholarly group, sponsored partly by the European Science Foundation, which in the past year has been investigating opera's theatrical practices as exhibited in the staging of opera, with a specific emphasis on the changing culture of dramatic performance, and reflecting particularly on opera's peculiar histrionic culture both in terms of the external demonstration of a role (gesture, *mise en scène*, costuming) and the internal approaches of the performer (ideas of acting). I am also pursuing an individual research project on the intersections between music and technology in the modern theatrical stage. This project accounts for the specific techniques and apparatuses used on stage and for their circulation between European theaters and theatrical cultures. It recognizes the emergence of a new techno-aesthetic paradigm of musical experience in theatrical production and reception beginning around 1800 and develops new theoretical approaches to the study of opera and musical theater which brings to the forefront of intellectual consideration the ephemeral nature of sound as object and as experience. While in Portugal, I have absorbed into my research other themes germane to Portuguese history and culture. I am part of a research group at CESEM presently conducting work on the sources and history of nineteenth-century opera and of an INET research group pursuing a project on the twentieth-century recording industry.

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MAIN SCIENTIFIC AREA:
Satellite oceanography

Detection of Mesoscale Eddy-related Structures through Iso-SST Patterns

The Ocean circulation off the Portugal coast is influenced by upwelling currents and bathymetry effects, which produce countless and highly heterogeneous SST patterns. The extraction of information from corresponding remote sensing images is still an open research field. The aim of the present study is then to introduce a pattern recognition scheme to derive morphological information of mesoscale eddy-related structures, and to show its applicability in the complex oceanographic region under investigation. The motivation of the study is that edge-detection methods---which allow for detecting eddies in regions with a more stable dynamics (*e.g.*, in proximity of the Gulf Stream)---have a reduced applicability because here eddy-related structures may present smooth boundaries, and edges associated to strong temperature gradients may not correspond to any eddy. The lack alternative solution implies that SST remote sensing images are visually inspected when searching for eddy-related structures. The novel scheme here discussed exploits the shape of iso-SST patterns to code, with a rule-based definition, the process underlining the visual identification of rotating water masses. Results shows that this helps benchmarking the subjectivity of the visual classification, and producing morphological parameters helpful to annotate the outcomes of the image survey.

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ER Stress and the Unfolded Protein Response in Photoreceptor Degeneration

The endoplasmic reticulum (ER) is the cell organelle where secretory and membrane proteins are synthesized and folded. The presence of unfolded/misfolded proteins in the ER causes stress to the cell (“ER stress”) and activates the Unfolded Protein Response (UPR), a cellular response to restore homeostasis in the ER. The presence of misfolded proteins and activation of the UPR have been associated with many diseases and pathological conditions. We have previously established that, in *Drosophila*, an important component of the UPR, the IRE1/Xbp1 signaling pathway, acts as a protector signal against retinal degeneration caused by the presence of misfolded mutant Rhodopsin 1 in the ER of photoreceptors. Here, we will present our current and future plans to identify additional protector genes acting downstream to the IRE1/Xbp1 signaling pathway, by using conventional screening strategies in the *Drosophila* eye.

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MAIN SCIENTIFIC AREA: Anglo-Portuguese Studies

Portrayals of the Peninsular War: from the Novel to the Screen

A number of international events are planned to commemorate the bicentenary of the Napoleonic Wars and universities across Europe will be launching projects and conferences to examine the different aspects raised by conflict. Amongst them the Universities of York, Berlin, Mannheim and Madrid and in Portugal UNL are of particular note.

This project will focus on the literary and cinematographic portrayal of the Peninsular War in Portugal. The Napoleonic invasions of Portugal and Spain, which can be counted amongst the most important and well-documented military campaigns of the nineteenth century, have been widely interpreted by many authors writing from different political viewpoints and employing a range of interdisciplinary approaches. The project will endeavour to create an inventory of narratives and films set in Portugal between 1807 and 1812. The works will be analysed in accordance with international criteria for literary criticism, and with the most recent methodology concerning the transformation of fact and narrative into cinema.

The central aim of the Project is to make the planned lectures, academic papers, conferences and web site an integral part of the forthcoming bicentenary commemorations of the Napoleonic Wars in Portugal (1807-1812). The lesser-known representations of the Portuguese campaigns will be examined, not just to add to the already considerable wealth of academic study on the period, but also to provide more information for the growing appetite of the general public. To this end it is proposed to organize: 1) Public panel discussions; 2) Open University and summer courses on the subject; 3) Papers in peer reviewed journals, national and international; 4) A final publication (themed essays) containing the data gathered by the members of the institutions involved: CEAP-FCSH-UNL, and Universidade Aberta de Lisboa.

Research Team: David Glyn Evans; Foteini Vlachou; Gabriela Ferreira

Gândara da Silva e Borges Terenas; Maria de Deus Alves Duarte; Maria do Rosário Sampaio Soares de Sousa Leitão Lupi Bello.

Resources, Results and Repercussions: Apart from the vast bibliography which already exists on the subject, a well-documented essay on the Portuguese perception of presence of British and Napoleonic troops in Portugal has been published by a senior investigator in the current project and provided solid basis for further research: *O Portugal da Guerra Peninsular. A Visão dos militares britânicos (1808-1812)*. Lisboa, Edições Colibri, 2000.

* Junior researchers and graduate students of the FCSH will also be involved in the project, leading to the writing of postgraduate theses. A Greek Ph.D candidate with expertise in this area, recently involved in the CEAP/CETAPS activities, Foteini Vlachou, has already published two relevant peer reviewed papers: “Between History and Art. Drawings, Engravings and the Interpretation of the Peninsular War”; “Cruel Invaders of Country, Perfidious Enemy of the Human Race: Patriotism, Painting and Propaganda in the Iberian Peninsula during the Revolutionary and Napoleonic Wars”.

* The CEAP hosted an International Conference on the Peninsular War at Fundação Calouste Gulbenkian, Lisboa, in a joint venture with the Academia Portuguesa de História, Centro de História da Universidade de Lisboa and Comissão Portuguesa da História Militar, in which all the Project members participated: ‘A Guerra no Cinema’: “Representações da Guerra Peninsular: do Romance ao Ecrã” (8-11-2007). The conference was held in November, two months after the project began, and the Proceedings have been already published: *A Guerra Peninsular. Perspectivas Multidisciplinares. Congresso Internacional e Interdisciplinar Evocativo da Guerra Peninsular, Integrando o XVII Colóquio de História Militar Nos 200 Anos das Invasões Napoleónicas em Portugal.* Lisboa: Caleidoscópio, 2008.

Networking: Invited Lecturer - Professor James Chapman (Director of *Film Studies*, University of Leicester) *British Cinema And The Napoleonic Wars*: *The Iron Duke* (Victor Saville) and *Lady Hamilton* (Alexander Korda), Discussion of British feature films about the Revolutionary and Napoleonic Wars. 29 February 2008.

***** International Project *Nations, Borders, Identities / The Revolutionary And Napoleonic Wars In European Experiences And Memories*. International Conferences Mannheim, 11-13 October 2007. York, 16-18 May 2008.

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-particles and biomaterials-processing
-development of functional ingredients

Development of polymer and lipid-based delivery systems, with application in pharmaceutical, cosmetic and food industries

Intensive research work has been conducted related with the development of alternative and efficient clean processes for particle formation (micro and nano-scale), and incorporation of active substances in biocompatible and biodegradable matrices with application on the preparation of sustained delivery systems. The encapsulation and impregnation of active compounds using conventional and non-conventional techniques, such as supercritical fluid processes, are currently under study. An alternative clean process, using supercritical carbon dioxide, for the impregnation of some polymeric matrices with biological active drugs was developed and applied. Experiments on the preparation of microspheres impregnated with bioactive compounds were performed using anti-inflammatory drugs and ethylcellulose, methylethylcellulose, PEG (polyethylene glycol) and PLA (Poly lactic acid) as carrier materials.

Supercritical fluid technology offers the possibility of producing very small particles with a narrow size distribution, avoiding multistep processes and aggressive processing conditions. PGSS® (Particles from Gas Saturated Solution) methodology has been applied for the preparation of lipid-based particles, that enable the production of low-micro systems as carriers or solubility enhancers for active substances. The carriers processed so far included polyglycolized glycerides, such as precirol, gelucire, compritol, cutina and glyceryl monostearate.

At the present we are extending the developed supercritical fluid techniques for particles and materials-processing, to a wide range of applications, with particular interest in the sustained delivery of macromolecular drugs and biological materials.

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Ionic liquids for Chemical and Biological Processes

The scientific plan envisaged for the next 5 years of research is devoted to the synthesis, characterization, and study of properties of new liquid salts and ionic liquid containing solutions aiming at exploiting new chemical and biological extractive and purification processes.

Several distinct research lines will be exploited in order to broaden the industrial application of ionic liquids. On the sequence of a recently published Nature paper from our group, I will continue deeply involved on the characterization of the gas-phase of ionic liquids. However, it is also my intention to interconnect my background on ionic liquids with new areas of research such as mycology, nanotechnology or separation processes (adsorption, extraction, etc…). Cooperation agreements for all these areas, either with other Ciência 2007 researchers from ITQB or with other FCT/UNL researchers were already established.

The main objectives of my future research include:

- Purification of organic acids using ionic liquids;
- Development of competitive separation technologies for hydrocarbon/aromatic mixtures;
- Waste elimination using ionic liquid bio-engineered eukaryotic organisms;
- Study of the behavior of ionic liquids and ionic liquid mixtures in nanopores and development of possible applications on the biology field.

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3D Geologic Modeling

What is it? A 3D Geologic Model (3DGM) is a 3-dimensional representation of rocks and sediments distribution at both the Earth's surface and subsurface. 3DGM is a fundamental tool for natural reservoir characterization and modeling, namely in oil industry, and an increasingly used tool in land use planning and mitigation of geological and environmental hazards.

Why use it? To accompany and to take benefit of the potentialities of the new technologies which already let us to produce and visualize digital 3DGM. This can be a powerful tool to understanding geology. The traditional 2D geologic maps no longer are sufficient for storing, displaying, and transmitting geosciences information, while 3DGM allows us to get a realistic visualization and to model the geometry and the properties of the geological setting at 3D. This is needed to provide users with geologic information of the quality and detail necessary to solve problems related to natural hazard mitigation, resource management, mineral and petroleum exploration, contaminant dispersion, etc. 3DGM is also a fundamental base to develop 4D models for analysis, prediction and/or paleo-reconstruction of geologic, tectonic and hidrogeologic structures and processes.

How do we do it? Implementing and developing a research group in 3DGM. To fulfill this goal we aim 1) to enter in *gOcad* consortium; 2) to acquire basic competences in *gOcad* software and 3) to establish collaboration with the Nancy School of Geology, an institution with scientific and technical experience in *gOcad* and "3DM of Geological objects and Geostatistics". We aim to produce 3D geologic maps, and develop some techniques needed to produce 3D maps that retain all the detail in traditional maps while extending this information into the subsurface.

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Nanocrystalline Silicon for Thin-Film Solar Cells

Hydrogenated nanocrystalline silicon (nc-Si:H) is considered one of the most promising materials for thin-film solar cells. Nc-Si:H is known to be a complex material consisting of crystalline and amorphous silicon phases plus grain boundaries. Although this material has a complex microstructure, its optical properties are similar to crystalline Si: an optical gap at 1.12 eV. This implies the spectral absorption of nc-Si:H covers a much larger range than amorphous silicon (a-Si:H) which posses an optical gap between 1.6 and 1.75 eV. Compared to a-Si:H, that absorbs light up to 800 nm, nc-Si:H absorbs light coming from a wider spectral range, extending up to 1100 nm.

P-type nc-Si:H can be used as a window layer in a-Si:H solar cells. Intrinsic nc-Si:H layers are successfully introduced as photogeneration layers into complete nc-Si:H thin films solar cells. Moreover, nc-Si:H can be advantageously combined with a-Si:H to form so-called "micromorph" tandem solar cells. A micromorph solar cell consists of the "stack" of a "top" (where light enters first) a-Si:H cell and of a "bottom" nc-Si:H cell. Furthermore, the nc-Si:H solar cell is reported to be largely stable against light induced degradation.

Nc-Si:H is obtained by Plasma Enhanced chemical Vapour Deposition (PE-CVD). We investigate efficiency of doping nc-Si:H with dopant gas $B(CH_3)_3$. As well, we study the influence of deposition parameters (deposition pressure, power of plasma, mixture of reactant gases) on structural, optical and electrical properties of nc-Si:H. One of the main goals of this research is to achieve high deposition growth rate maintaining good properties of the material.

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MAIN SCIENTIFIC AREA: Structural Biology

Molecular Interactions and NMR

Nuclear Magnetic Resonance Spectroscopy (NMR) is one of the few tools that allow us to look at molecules at atomic resolution. In doing so, we can deduce the function of the molecules as well as understand why biomolecules fail to work and cause disease. The time and effort in such studies is proportional to the size of the molecule you wish to study. The methods we employ in the lab provide useful tricks. We study small molecules to obtain an imprint of the active site, like a photographic negative. In this way we obtain selective information about the most interesting part of a biomolecule without the hard work of producing large amounts of protein to do a full structural analysis. The obtained information can then be used to design new drugs. Our special NMR methods can also be applied to biomolecules that cannot be studied by other structural biology methods, such as cell surface receptors – around half of our prescription drugs bind to such proteins and they are extremely difficult to perform structural studies on.

We also use diffusion NMR (DOSY) to measure the size of molecules. DOSY can be applied to proteins, peptides, small molecules, DNA, oligomers, polymers, detergents, aggregates…

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TEXTILES, TRADE AND TASTE
Portugal and Asia, 16th and 17th centuries

Much has been written over the years on Portuguese involvement in the Asian commodities trade. Historical attention has concentrated primarily on the major exports, such as pepper, spices and drugs, while art historical research has focused on the transmission of luxury goods, such as ivory, exotica and porcelain. Portuguese sources also indicate the existence of a large-scale and lucrative trade in Asian textiles, but this has been virtually ignored until recently. What precisely did these textiles look like? Who were their consumers? How were they used? And what was their impact? These are questions which can only be very partially or sketchily answered at present.

The five-year research project, *Textiles, Trade and Taste*, aims to make a major contribution towards raising the profile of these objects as an important part of the visual, material, social, and economic culture of Portugal in the 16th and 17th centuries. Textiles can be read in many ways: as works of art, commercial commodities, objects of status, items of fashion, decorative furnishings, elements of courtly and religious ceremonial, as well as itinerant ambassadors of taste, style and design in the context of globalization. The project will involve the elaboration of 1) a programme of scholarly research; 2) the creation of a textile database and an academic network; 3) an international conference; and 4) an art exhibition.

A series of collaborative endeavours with colleagues at CHAM are also underway, including the proposed publication of an extremely important 16th century inventory.

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Computer Science
(High-Performance and Grid Computing)

High-Performance Computing Framework for Geological Sciences

The objective of the present research project is to provide new methods and software tools for High-Performance Computing (HPC) and Grid Computing with the aim of facilitating problem solving in Earth, Space and Sea sciences. In these application domains, scientists gather a large amount of observed data through various types of observatory sensor networks and describe the data in terms of mathematical models, which are verified by means of computer simulations. Those models that are found to be good descriptions of the observed data are then used for their intended purposes such as forecast, prediction and planning. This process of scientific problem solving creates a variety of computation needs, constituting the context of our study. The major difficulties in this context come from the diversity of computer architectures and their rapid change. Large clusters consisting of many multi-core machines are popular nowadays and found not only in centralized computer centres but also in distributed local research institutions. This implies that domain scientists themselves are constantly required to set up new clusters, learn how to use them, and keep them up-to-date to meet their increasing computation needs. More efforts have been directed to the means instead of the ends, and thus productivity has been compromised. Therefore, a robust and domain-oriented framework for HPC and Grid Computing is necessary to abstract the details of underlying computer architectures, allow the domain scientists to concentrate on their original problems, and achieve high productivity. We begin with the identification of open issues through an extensive survey of existing HPC and Grid Computing research projects in the target domains, and set the dimensions of our study.

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Conservation and Restoration of Cultural Heritage: the Earth Sciences Contribution

Conservation and Restoration Sciences deal with diverse materials, many of them directly related to the Earth Sciences. The more evident use of geological materials is, of course, as a support for paintings (e.g., in caves) and for sculptures, and as construction materials for various buildings. Gemstones also play a major role on jewellery.

However, geological materials are not limited to stones and minerals in the simplest sense. Many apparently unsuspected materials involved in art works are related with geological resources. This is the case of ceramics and glass, and of plasters and concrete, that use grinded rocks and / or minerals for their making. This is also true for many inorganic pigments that are present in dying substances and in inks that use some specific minerals as colorants.

As far as Conservation and Restoration Sciences are concerned, one of the first steps taken is to characterize the materials that are to be preserved or restored, as well as to characterize the mechanisms involved in their transformation.

Therefore, research is focused on the involved materials characterization and on the modifications they can experience, caused by physical, chemical, biological and geological factors. Materials characterization can be made both on non-modified materials and on altered materials, thus leading to maximal information about the materials intrinsic properties and about the changes they undergo. If the materials involved are of geological nature, Earth Sciences have a lot to say about it.

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An Inquiry into the Logic(s) of Knowledge and Context

In the last two or three decades epistemology, traditionally associated with the double project of providing a satisfactory analysis of knowledge and cognate notions (such as that of justification) and an effective response to scepticism, has seen two major turns:

- a "new linguistic turn," through the increased reliance, in contemporary epistemological debates, upon "evidence" regarding how we ordinarily *talk* about knowledge, most notably as a result of the flourishing discussions about the purported epistemological role of various notions of context (the knower's context, the attributor's context, the assessor's context, etc.) and the relative merits of "contextualism" over "sceptical" and "commonsense invariantisms";
- a "logical turn," through the rising conviction that discussions in traditional epistemology may benefit from formal epistemology (epistemic logic, formal learning theory, belief revision, and so on), notably by applying the formal methods of modal epistemic logic in order to gain insights into traditional informal epistemological issues.

The present research project, at the junction of epistemology, epistemic logic, and philosophical linguistics, aims primarily at investigating the principles for talking and reasoning about the static as well as dynamic aspects of various forms of knowledge (e.g. declarative or propositional knowledge, procedural or dispositional knowledge) and various kinds of context (e.g. context of inquiry, conversational context), with an eye to gaining philosophical insights into the two notions and their interactions.

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Characterisation of NiTi shape memory alloys

Shape memory effect (SME) is a physical phenomenon exhibited by some materials, prominently alloys. By virtue of this phenomenon, when the alloy is plastically deformed and heated above a certain temperature, it regains its original shape. There are many alloys showing this unusual behaviour but, the binary alloy, Nickel-Titanium (NiTi) is the widely studied and employed one exploiting SME. The effect is originated due to the metallurgical process known as thermo-elastic martensite phase transformation.

In CENIMAT, the present researcher is conducting various types of heat treatments on NiTi alloys of different stoichiometry and their effect on phase transformations. Phase transformation characterisation is mainly carried out by home-made electrical resistance probes which are designed to measure during thermal and mechanical cycles. Recently, a special heat treatment comprising of subjecting the alloys to successive annealing followed by quenching treatment has been undertaken and interesting results are revealed. The study is in progress to elucidate the processes involved during this special heat treatment.

Further, the corrosion studies are made on Ni-rich and Ti-rich NiTi alloys. Although there was not much difference in the electrochemical responses of these two alloys, comparatively, the latter has better corrosion resistance. Ni-rich alloy subjected to heat treatments do not show significant differences among themselves and the AR samples.

Studies have also been underway in nanostructures of NiTi alloys after subjecting them to severe plastic deformation.

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MAIN SCIENTIFIC AREA:
Ionic liquids for Chemical and Biological Processes

Development of Biologically Active Ionic Liquids

Ionic Liquids (ILs) are a class of neoteric compounds which has been motivating a lot of research due to its unique properties, which can be tailored for a specific application. In the last decade, synthetic ILs have been produced and characterized from the physical and chemical point. Nowadays, there is a search for new ILs and emphasis is put on their use in biological processes. The aim of this work is to develop new biological active Ionic Liquids using fluoroquinolones as active pharmaceutical ingredient (API). These new functional ILs represent an improvement over their API by providing new improved properties and drug delivery pathways through criterious choice of the ions. The solubility of the prepared ILs-APIs in several relevant solvents will be measured using UV-vis spectroscopy as well as their partition between organic phases, including liposomes and ILs, and water, which will be achieved using the flask shake method or the slow stirring method, depending on the thermophysical properties of the obtained ILs-APIs. Structure-activity relationship (QSAR) models will be developed from the measured experimental data.

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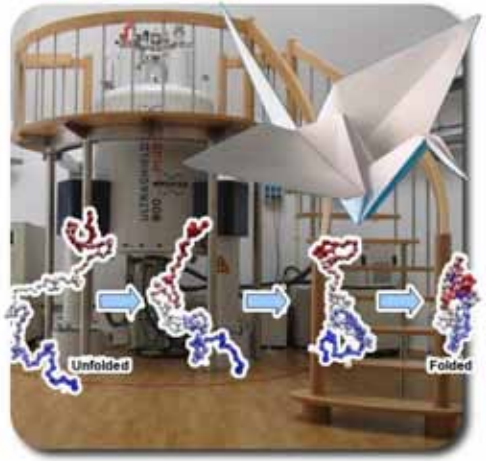
MAIN SCIENTIFIC AREA:

Biomolecular NMR, Structural Biology

The main topic of our research is the study of proteins and enzymes. These molecules, the machineries of every organism, can perform almost any chemical and mechanical task in an organism. They achieve that by folding in very particular shapes, like the Japanese paper Origami's. The elucidation of that structure is the basis of my research. Using the technique called Nuclear Magnetic Resonance (NMR) we can get information about almost every atom of these systems. Measurement of distances among atoms allows us to deduce the structure of the molecule and then we are start to understand the function that protein has in nature.



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Studies on the Grammar of Medieval Portuguese

Medieval Portuguese (MP) covers the period mediating between the first known written texts in Galician-Portuguese (late 12th century) and 1536, that is, the date the first grammar has appeared. Despite being a conservative language, Contemporary European Portuguese (CEP) shows many differences with respect to past stages of the language, in particular, to the oldest one.

The research project *Studies on the Grammar of Medieval Portuguese* aims at thoroughly describing and understanding the system and use of the language in MP, contributing in this way to a better knowledge of the grammar of MP. For that reason, it is crucial to understand the changes that occurred both at the morpho-syntactic and the syntactic-semantic levels between MP and CEP and to improve/enlarge the available computational tools for linguistic purposes, such as written *corpora*, annotated *corpora*, dictionaries, glossaries and grammars.

This project, however, is only feasible because it is being developed in cooperation with the other research projects from CLUNL, namely, in the improvement of the existing tools (digitalized *corpora* for linguistic analysis), dictionaries and glossaries with larger and diversified *corpora*. It is worth mentioning that two dictionaries have already been edited by CLUNL, the *Dicionário de Verbos Portugueses do Século 13*, in 1999, and the *Dicionário de Verbos do Português Medieval*. *Séculos 12 e 13/14*, in 2002, and that the *Dicionário do Português Medieval* is in progress.

However, since words cannot be taken in isolation and dictionaries do not contain all the relevant information, the building up of a grammar based on the description of actual data is extremely important. This is the specific goal of the project *Studies on the Grammar of Medieval Portuguese*, in progress at CLUNL.

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Manuscript Information on the Portuguese Seaborne Empire

Fonds related to the Portuguese Seaborne Empire are scattered throughout several archives, both public and private, in Portugal and abroad. Finding out specific information on such a variety of possible locations may prove a difficult task, especially because there are still very few studies on the way official records were originally kept and later reorganized. One of my major priorities is to gather evidence for a history of the documents produced by the Overseas Council and the Secretary of State for the Navy and Overseas Dominions, until the end of the Ancient Regime (1833). Part of that work is undertaken in collaboration with the Brazilian Ministry of Culture, which has a long-term project aiming to catalogue and microfilm manuscript resources from the colonial period found on foreign archives. The rest of my efforts are divided through some different case-studies, each of one integrated on previously approved FCT collective research projects (PTDC/ HAH/64160/2006 e PTDC/HAH/64759/ 2006), or simply derived from the problems posed by the contents of series documents themselves. Such an approach tends to favor the insertion in a broad institutional network, whereas leaving some space for individual initiative and creativity.

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MAIN SCIENTIFIC AREA: Biology

Infection Biology: the interaction between *Chlamydia trachomatis* and eukaryotic host cells

The human body is constantly in contact with microorganisms. These include the normal flora, which normally establish intimate and beneficial interactions with the human host, and the millions of microbes that we are exposed to in our daily activities. The vast majority of these microbes have no harmful effects. However, a few – microbial pathogens - have evolved molecular mechanisms that enable them to escape immune defences and to cause disease. The Infection Biology laboratory at the ITQB aims to understand the molecular and cellular mechanisms by which bacterial pathogens modify the normal functioning of animal host cells. We focus on the human pathogen *Chlamydia trachomatis*, the most frequent bacterial cause of sexually transmitted diseases and the leading cause of preventable blindness worldwide. Like other chlamydiae, *C. trachomatis* code for the core components of a type III secretion system, a protein transport mechanism used by several Gram-negative bacteria to translocate 'effector' virulence proteins from the bacterial cytoplasm directly into the cytosol or membranes of eukaryotic host cells. *C. trachomatis* translocate at least ~ 60-90 effectors into host cells. We will study the secretion and function of chlamydial T3S effectors. This basic research will eventually help at combating infectious diseases and, as microbial pathogens are the ultimate cell biologists, promises to provide insights on fundamental eukaryotic cell biology.

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MAIN SCIENTIFIC AREA: Music

Renaissance Music

Polyphony in the Iberian Peninsula and Northern Europe

My research encompasses a number of interrelated projects, the majority of which are connected with musical sources and topics in musical historiography in the Iberian Peninsula and in northern Europe during the Renaissance and Early Baroque Period. The focus is on sacred liturgical vocal and keyboard music dating from the 15th century onwards, its intrinsic development in the Iberian Peninsula, and the relationships that can be traced between northern European musical traditions and those that developed in Spain and Portugal partially as a result of inter-dynastic marriages and patronage.
Projects include: (1) The music of Cristóbal de Morales (d. 1553); (2) The music of Noel Bauldeweyn (d. 1529) – work leading to the publication of a new study and edition of his music; (3) Topics in keyboard music in the Iberian Peninsula, with a focus on the earliest anthological collections published in Spain and Portugal;(4) Music in the courts and musical chapels of the Avis Dynasty in Portugal, focusing on connections with the Burgundian court of Philippe le Bon (d. 1467); (5) Music and musical sources in 16th and 17th-century Portugal. In addition, I am also involved in a project directed in CESEM concerning the cataloguing, categorization, etc, of a new archive that has been created of digital photographs of early musical sources (including fragments) of both plainchant and vocal polyphony in Portugal for the creation of a database.

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Science Education and Computational Modelling

Present day state of the art research in science is the result of a profound interconnection between theory, experiment and computation. In an approach to science education in phase with the rapid development of science and technology, scientific computation should be introduced early in the learning environment. This goal may be achieved with Modellus, a software tool that allows the integration of elements of computational modelling in interactive and exploratory science education. In this project we focus on physics education research to enhance introductory general physics in science and engineering courses with interactive and exploratory learning based on computational modelling. This action should be an important step forward to reduce the traditional high level of failure in the general physics courses and to build a positive attitude towards physics with an improved awareness of its relevant role in modern technological society. With this aim in sigh, we have implemented a set of innovative workshop activities in the general physics course taken by first year students of the biomedical engineering course at the Faculty of Sciences and Technology of the New Lisbon University (FCTUNL). The workshop activities were organized as interactive and exploratory learning experiences where students worked as teams of scientists on a small number of problems about challenging but easily observed physical phenomena. All activities were created as mathematical modelling experiments with Modellus and consisted of a set of tasks, presented in PDF documents, with embedded video guidance to support students both in class and/or at home in a collaborative online context based on the Moodle learning environment. Special emphasis was given to cognitive conflicts in the understanding of physical concepts, to the manipulation of multiple representations of mathematical models and to the interplay between analytical and numerical approaches to the solution of physical problems. Future actions will involve several interconnected projects, for example: the implementation of a complete interactive and exploratory general

physics course based on data logging and scientific computation for a selected group of FCTUNL first year students; the design of a new set of computational modelling educational activities based on Modellus for the biophysics course to be taught to first year students of biomedical engineering; to continue and renovate the computational modelling component of the biomedical engineering general physics course; to create other computational modelling projects with Modellus relevant for electromagnetism, fluids, thermodynamics and modern physics topics involving quantum mechanics, relativity, astrophysics, particle physics and biomedical physics and for other areas of science such as biology, chemistry, geology and mathematics; to organize projects in science education and computational modelling for master or PhD students in education; and to develop new functionalities to enhance Modellus as a computational modelling tool for science education.

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CENTRO DE RECURSOS MICROBIOLÓGICOS

Regulatory circuits controlling the expression of β-lactam resistance in staphylococci

Methicillin-resistant *Staphylococcus aureus* (MRSA) are a leading cause of nosocomial infections worldwide and, in recent years, have also emerged as community acquired pathogens (CA-MRSA), being able to cause lethal infections among otherwise healthy people. Most epidemic MRSA strains are resistant not only to all β-lactams, but also to virtually all classes of antimicrobial agents leaving clinicians with very few therapeutic options.

Although β-lactams, targeting the cell wall synthesis machinery, were the first class of antimicrobial agents to be introduced in the clinical practice, they are still the most efficient, the less expensive and the less toxic class of antimicrobial agents. Moreover, in the past 40 years, very few antibiotics representing new chemical classes have reached the clinic.

By understanding in detail how β-lactam resistance is regulated, we might contribute to the design of complementary therapeutic strategies targeting the regulatory mechanisms which eventually will extend the clinical utility of these important class of antimicrobial agents – antibiotic recycling. In order to achieve this ultimate goal our research efforts are divided in two themes:

- regulatory circuits controlling the expression of β-lactam resistance;
- resistance to β-lactams in a broad cellular perspective.

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Organic Chemistry

The Chemical Education of Blinds and People with Visual Disabilities

Blind people and people with severe visual disabilities are at this moment in Portugal (and elsewhere) practically excluded from education in many areas of sciences, particularly in organic chemistry. Information in these sciences is often based on 2D diagrams or 3D models, and data is presented visually in ways difficult for a blind person to interpret.

To promote higher education of sciences for blind people or people with several visual disabilities, we intend to make accessible to them the perception of the molecular structures of organic compounds, as well the contents and concepts of Organic Chemistry, with support of Information and Communication Technologies (ICT).

The developed methodology of teaching integrated two main components:
- web modules with the presentation of contents as text, including concepts, explanations, examples, stories, activities, problems, and answers; and
- software specifically designed for blind users to interpret and edit molecular structures.

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Applied and Environmental Mycology
Fungal white technology under anthropogenic stresses, pollutants and molten salts

Nowadays, in Europe, the waste production per year is c. 1.3 billion tonnes (~5% is hazardous), leading to serious environmental damage and endangering human health. Globally, environmental awareness is encouraging the use of green biological processes, technologies and products.

Research activities were built in order to tackle these challenging global problems. A better understanding of microbial diversity may lead to its use as a source of novel microorganisms and biomolecules for a variety of biotechnological applications, especially within biodegradation and bioremediation.

Fungi are vital for the ecosystem functions, with more than 70,000 species already described (total number is estimated to be >1.5 million) and can degrade a broad range of complex and toxic compounds.

Ionic liquids, i.e. molten salts, are classified as green alternative solvents, offering unexpected opportunities on the interface with the life sciences. However, in order to move these solvents beyond being an academic curiosity, their environmental, health, and safety impact must be investigated.

Fungal degradation of water-insoluble residues to their forming elements, controlling biocatalysis efficiency trough the solvent, represents a rather ambitious scientific breakthrough: *optimizing nature toolset exploitation to the environmental and the industry*.

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Structure of Si-Na-Mg Glasses Studied by Vibrational Spectroscopy

Effect of substitution of Mg^{2+} ions for Na^{+} in the structure of glasses with 55 mol% SiO_2 was investigated by Raman and FTIR. The structure predominantly comprised 2 and 3 coordinated species, Si-centred, denoted Q^2 and Q^3. For higher Mg^{2+} contents the Q^3 species tends to increase with expend of the Q^2 species. Changes in the intrinsic network structure can be explained by a disproportionation equilibrium: $2Q^2 \leftrightarrows Q^1 + Q^3$.

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Context in Communication and its Modelling

When Alice says *We have been to the moon* to Bob, both the sentence for itself and Alice's utterance (a speech act) can be interpreted in various ways, and it can be argued quite convincingly that every expression in this example is context dependent. *We* refers to a group associated with the speaker, but which one? Is a specific journey to the moon like the Apollo 11 mission meant or does the speaker only want to assert the generic fact that we have been to the moon once in the past? What does being to a place exactly mean and what does it take to be to a celestial body as opposed to, say, being to a pub? Why do we so easily understand that *the moon* has to be interpreted as *the Earth's moon* in our context? What does the utterance mean literally and is this perhaps obviously false literal meaning required in order to understand the utterance? An adequate theory of context in communication has to answer all of these question in one way or another. As an intermediary step towards such a theory, a particular aspect of linguistic context dependency known as Quantifier Domain Restriction, which is illustrated by the restriction from *the moon* to *the Earth's moon* in the above example, has been implemented as a dependency of the literal meaning of the respective expression (e.g. *the moon*) on a previously introduced interpreter (e.g. Bob) within a logical language in a well-known framework called Categorial Grammar. Further research will focus on extending this kind of analysis to deal with other cases of context dependency, linking up an interpretation operator with a representation of the beliefs of discourse participants, and subsequently model someone's revision of his beliefs when he accepts an utterance to some degree.

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Biosensors

Biosensors have enormous applications in key areas of human life such as pharmacology, medicine, food & drugs, and environment. An important category of biosensor is the chemical type made with ionic self-assembled nano-multi-layer poly-electrolyte films deposited onto a inter-digital metal surface. The production of such films involves adsorption from aqueous solution with oppositely charged diluted polymers repeated in pairs which form bi-layers. Reagents such as DNA, enzymes and organic/inorganic molecules are *selectively* deposited onto the last layers. We aim to study and design the biosensors by using optical (e.g. ellipsometry, spectrometry, XPS), particle (e.g. SIMS), electrical (e.g. AFM and Impedance Spectroscopy) and statistical analysis (e.g. PCA) techniques plus developing instrumentation.

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Proteomics & Functional Genomics

Parasite Post-genomics

The recent completion of whole genome sequences of several parasites provides the foundation for genome-wide analysis. In addition to DNA and gene sequence data, scientists can now start to get valuable insights into the world of mRNA molecules, proteins and their posttranslational modifications as well as the correspondent metabolites within a cell (such as lipids and carbohydrates). Unlike the genome which is fixed in a given cell, these components vary depending on the environmental context and developmental stage of the organism.

Analysing the protein complement of these parasites and their structural variants require technically demanding methods at the interface between chemistry and biology. A typical workflow to analyse a proteome involves processing the biological material, subsequent separation and mass spectrometric analysis followed by the use of a combination of bioinformatics tools to access the accuracy of both the qualitative and quantitative mapping of the proteins present in a given context (e.g. upon infection or treatment with a drug).

Another aspect of the availability of the genome information is the possibility of designing ways of interfering with a specific gene function and determine its essentiality and function.

The ultimate goal of the information obtained through these comparative studies is to exploit fundamental biological differences between host and the parasite in order to develop new drugs, vaccines and diagnostic tools.

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Chemoresistance Studies in *L. infantum* Infections

Leishmaniasis is a group of diseases caused by an obligatory intracellular protozoan of the Trypanosomatidae family that multiply as the amastigote form in the macrophages of their vertebrate hosts*. Leishmania infantum* is the main agent of human and canine leishmaniasis in the Mediterranean Basin. Since vaccines against leishmaniasis are still under development, the control of this disease relies on prompt diagnosis and chemotherapy. Although several drugs are available for leishmaniasis treatment, the increasing levels of chemoresistance limits their effectiveness. Fungizone® (Amphotericin B) has been used as a second line drug in the treatment of the disease because, despite of the associated toxicity, no cases of resistance have yet been reported. Resistance to the drugs Glucantime®, Fungizone®, Miltefosine and Allopurinol in *L. infantum* infection was evaluated through two different *in vitro* systems (axenic promastigotes and amastigote-macrophage), using strains isolated from humans and dogs, both in their wild-type forms and after *in vitro* induction of resistance to Fungizone®. It was found that the strains treated with Fungizone ® became more resistant to treatment with this drug and more susceptible to allopurinol. Infected macrophages produced higher levels of TNF-α when treated with higher drug doses, while those treated with lower drug doses produced higher levels of IL-10. Genetic resistance of the parasite was analysed through possible alterations in the *mdr1* gene sequence, before and after treatment with Fungizone®. Point mutations were found that may be associated with drug resistance, but further analysis should be performed in the future.

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Structural Biology of Metalloproteins /Metallomics

Metals in Bacteria

The research project consists on the elucidation of physiological roles and function of metalo-biomolecules, which can be denominated as “Metallomics” or also described as “metal-assisted function biochemistry”. The organism selected for this project is the bacterium *Deinococcus radiodurans* which is extremely resistant to ionizing radiation, desiccation, as well as to several other stress conditions. In this project different spectroscopy and synchrotron techniques will be used.
Iron is an essential element to almost all organisms. Its chemical properties allow it to participate in numerous biological reactions. The intracellular concentration of this element is highly controlled to avoid an overload or a deficiency situation of this element that could be lethal. Ferritins are iron-storage proteins present in organisms of the three life domains: Archaea, Bacteria and Eukarya. The overall structure is conserved between the different groups, they all share a hollow spherical shape with a cavity in which the iron is stored in a form not dangerous for the cell. The superfamily of these proteins can be divided into three major groups: ferritins, bacterial ferritins and hemoferritins. However, a new family has emerged, named Dps (DNA-binding proteins from starved cells), which can store iron and/or bind DNA, protecting it against oxidative stress. *D.radiodurans* is known to accumulate high intracellular manganese and to maintain low iron levels. In the *D.radiodurans* genome there are two genes encoding for Dps, which have been structural characterized and will be presented. In conclusion, the study of iron metabolism in *D.radiodurans* is the first part of the project proposed.

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MAIN SCIENTIFIC AREA:
Anthropology

At home in “Portugal Village”.

Domestic consumption practices, identity narratives and trajectories of a Portuguese migrant community in Canada.

This project examines the domestic consumption practices of a group of Portuguese migrant families presently residing in “Portugal Village”, Toronto, Canada. Theoretically, the research aims the integration of Material Culture and Consumption Studies, a recent subject field within Portuguese Anthropology, as a contribution to the discussion of the trajectories and identity narratives in migration processes. Consumption practices will be observed as both an expression of the subjects’ social relations with others and with goods, validating the idea that they actively and strategically use objects for the production of meaning, as well as markers of their social actions and identities.

The election of the domestic space as research site is justified not only by its centrality to consumption in itself, but also because home is almost always the most privileged context for the expression of cultural practices “transported” from the context of origin, to the manifestation of the sentiments of loss involved in migration and to the articulation and management of relations with the past context. Likewise, choosing the home as the key site of observation establishes the conditions to focus the research on the “everyday practices”, and privileging As the term suggests, an approach centred on the “everyday” corresponds to a decision that privileges the “regular” and the “day to day” activities, by opposition to the “exceptional” and “unique” episodes of people’s lives.

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Atomic Force Microscopy (AFM) Applied to the Study of Molecular Degradation Mechanisms of Materials in Art and Archaeology

The motivation of this project is the stimuli for a larger interdisciplinary on the study of the physical, chemical and biological degradation of the materials used in the artistic production taking as the first priority the preventive conservation, and taking profit from the knowledge and facilities existing in the FCT-UNL Campus.

The art materials to be studied will include paintings, polychrome sculpture, miniature illuminations, stone, metals, glass & ceramics, textiles, and materials used in modern art.

Characterization of morphological and mechanical changes taking place after ageing, in protective coatings and cleaning procedures have attracted attention of scientists and art conservators who have developed specific techniques. As an alternative to conventional microscopy techniques, atomic force microscopy (AFM) has been proposed, in recent decades, for examination of artworks. AFM allows the possibility of obtaining a 3D topographic image and profile surfaces, at the nanometer scale, from electrically conductive or insulating specimen without specific preparation.

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Transcription factors involved in plant responses to environmental stress

Adverse environmental conditions (also known as abiotic stress), such as drought, cold, and salinity strongly affect plant growth and development. They have a tremendous impact in the world agriculture causing more than 50% yield loss in annual crops. Given that plants are unable to escape, they have developed unique mechanisms to cope with abiotic stress. After plant perception of the stress, signal transduction occurs leading to changes in gene expression and production of proteins involved in protection and repair processes. Since the expression (transcription) of the stress-responsive genes is strictly regulated, transcription factors (TFs) must play a central role on the plant response to the environment. TFs bind the promoter of specific genes to regulate their expression.

During the last decade, many TFs involved in abiotic stress responses have been identified. However, the functional characterization of most of these regulators is poor and many are still unknown. In order to obtain more insight into this area of high agronomical impact, we need to better understand the network of TFs and TF-interacting proteins involved in the plant responses to stress. Using a yeast-based system, we have identified rice TFs that bind to the promoter of key genes involved in either low temperature or salinity responses. These novel TFs are then characterized at molecular/biochemical level and transcriptional activity is studied. Furthermore, we analyze protein-DNA and protein-protein interactions and the biological function of the most interesting protein regulators is further investigated by over-expressing/silencing them in rice and *Arabidopsis*.

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MAIN SCIENTIFIC AREA:
Conservation & Restoration of Paintings

Materials, methodologies and technologies for conservation-restoration of polychrome artworks

The proposed investigation program, related to the project "*Study of the molecular degradation mechanisms of materials in Art and Archaeology*" developed in the area of Cultural Heritage by the CQFB - FCT of the UNL in Lisbon, has several directions based on the following scientific interests:

Characterization and **authentication** of materials in the structure of polychrome artefacts;

Studies on the **ageing** and **degradation mechanisms** of ancient/modern materials in the structure of polychrome artworks by means of analytical techniques;

Studies of the **conservation state** and **authentication** expertise of paintings;

Analytical tools for establishing the **best treatment** and **proper materials** for conservation interventions on paintings;

Studies of **compatibility** between new materials and techniques of intervention and ancient materials and traditional techniques of easel-paintings;

Methodologies for **establishing the effectiveness of restoration treatments** on polychrome artefacts, using various analytical techniques;

Digital preservation/archiving and **valorization** of movable cultural heritage, computerized storage of restoration documentation.

The research methodology for paintings is not only *interdisciplinary*, but also *complementary*, bringing together tools and methods of various sciences: Art history, Iconography, Iconology, Archaeology, Museology, Chemistry, Physics, Geology, Climatology, Biology, Proteomics.

Paintings – both easel and mural paintings – can be studied by means of *non invasive* and *micro-invasive techniques* such as OM (UV-Vis reflected and polarized light), SEM-EDX, AFM, XRF, XRD, FT-IR/μFT-IR, μRaman, DSC/TG/DTA/DTG, GC/HPLC, staining tests, colorimetry.

As reference methodology the **UNI-Normal 10945/2001** for the investigation of paint layers can be adopted.

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Study of Electron Harpooning studies on DNA bases and on macro molecules in gas phase and on “polymer beds”

The research will be divided in two subjects. In the first part, the stability and response of the macromolecules (including DNA bases) following the electron addition by electron transfer and the evolution of the systems is to be studied by Beam Methods. The electron affinity (EA) will be investigated by a crossed molecular beam technique by atom (potassium) molecule collisions. In this type of process an electron jump occurs and a positive ion K+ and a molecular anion are formed. The main interest in these processes comes from the fact that low-energy electrons may cause many of the lethal DNA lesions (single and double-strand breaks). These low energy electrons (1 to 20 eV) are created in numbers as high as 10^4 per MeV when ionizing radiation is absorbed in living tissues. In the second part, we aim for the study of macromolecules and DNA bases on “polymer beds”. The objective is the biofuncionalization of those systems in order to design and obtain nanoprobes and biosensors. The study of the structure is to be performed by AFM (contact, non contact and lateral force Atomic Force Microscopy).

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MAIN SCIENTIFIC AREA: Bionanotechnology

BIONANOTECHNOLOGY FOR DNA/RNA CHARACTERISATION

The Centre for Research in Human Molecular Genetics is devoted to studying the genetic basis of human diseases, aiming for both prevention and therapy. CIGMH encompasses three locations: at the Dept. of Life Sciences - Faculdade de Ciências e Tecnologia; at the Dept. of Genetics - Faculdade Ciências Médicas; and at Centre of Human Genetics - Instituto National de Saúde Dr. Ricardo Jorge.

The team at FCT/UNL (http://pessoa.fct.unl.pt/pmvb/), where this C2007 position will be integrated from December onwards, aims at the development of platforms for Nanodiagnostics (the use of nanotechnology based approaches for clinical diagnostics), namely on the use of gold nanoparticles functionalised with DNA - gold nanoprobes - for detection and capture of specific DNA/RNA sequences, including SNP/mutation detection, pathogen identification and gene expression studies.

Specifically, I will be involved in the development of new approaches for gene expression characterisation using gold nanoprobes, both *in vitro* and *in vivo*, and of gene silencing strategies taking advantage of the specific properties of nanoparticles acting as carriers.

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MAIN SCIENTIFIC AREA:
Bacterial Membrane Proteomics

Bacteria carefully regulate their shape by coordinating cell division and growth of the cell wall. These processes require the coordinated action of various proteins which are thought to be organised in large complexes. The molecular composition of these complexes however, is not known. Commonly used experimental techniques for detection of protein complexes are not suitable because most of the proteins involved are embedded in the bacterial membrane. In the Bacterial Membrane Proteomics laboratory, a newly developed technique will be used that has the resolving power to detect these complexes.

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MAIN SCIENTIFIC AREA: Hybrid solar cells

Hybrid Dye-sensitized Solar Cells: Photovoltaic Devices employ Inorganic-organic Semiconducting Materials

Parallel to the development of conventional solar cells, most of them based on the semiconductor silicon, research has been conducted for several years now on new, innovative types of solar technology. One example for the application of completely different materials with a high potential for cost reduction is given by dye-sensitized solar cell (DSSC) developed by Professor Grätzel and coworkers (1991) in Switzerland. In contrast to conventional silicon photovoltaic devices, the dye solar cell converts light energy to electricity on a molecular level- similar to natural photosynthesis.

However, all theses devices generally consist of expensive sensitizers such as ruthenium(II) polypyridyl complexes and electrolytes with volatile solvents. These factors, especially the fact that the liquid electrolyte causes significant technological problems associated with device sealing and stability, affect the commercial application of DSSCs. Therefore, there is a considerable interest in both the development of a solid-state electrolyte for these devices and replacement of expensive dyes with inexpensive and readily available materials. In this context, inexpensive conductive organic polymer materials, which behave either as sensitizers or holeconductors, are of practical interest as possible replacements for the liquid electrolyte and the sensitizers in these devices.

Therefore, in this work, fabrication and investigation of low cost, hybrid solar cells using inkjet printing techniques will be carried out with the aim of using them in several possible applications such as electrochromic devices and sensors.

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Production and Study of Oxide Thin Films for Photocatalysis

The evidence of photoelectrochemical splitting of water over titania (TiO_2) to form hydrogen and oxygen opened up greater possibilities of solar energy conversion of materials by semiconductors. Hydrogen is emerging as the favorite, environmentally friendly alternative to fossil fuels for the production and storage of energy. On the other hand water supplies are getting scarcer due to climate changes in many countries of world. The exploitation of every available water source is becoming increasingly necessary especially in rural areas where contamination of water by bacterial and organic compounds is a major health problem in the absence of adequate water treatment. Cheap, user-friendly, maintenance-free systems for water-treatment and water splitting into hydrogen and oxygen using renewable energy are therefore highly desirable. Photocatalysis using transition metal oxides (mainly TiO_2) has emerged as the method of choice for these two systems. However most of photocatalysts are sensitive only to the UV range of the solar spectrum. Therefore, it is of great interest to find ways to extend the absorption wavelength range of the photocatalysts into the visible region without decrease of photocatalytic activity.
The purpose of the present project is the production of photocatalysts based on transition metal oxides (TiO_2, ZnO, WO_3, MoO_2) by reactive dc-sputtering and the study of their photocatalytic properties, regarding water splitting and water treatment. The effectiveness of the prepared photocatalysts will be evaluated using ambient or concentrated solar radiation.

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MAIN SCIENTIFIC AREA: Biostatistics

On the behaviour of Age of Menarche and Menopause Onset in Central Portugal

The Portuguese Cancer League (LPCC), a private non-profit organization, deals with multiple issues related to oncology. One of the activities that the League is involved in is the National Breast Cancer Screening Program, under a financial contract from *Administração Regional de Saúde do Centro*, and which relies on hundreds of dedicated volunteers from all over the country to help with fundraising activities and patient support. Everyday new cases of breast cancer are detected, not only in older women but increasingly in younger women too. An early diagnosis of the disease can make a difference in the chances of survival of a patient, in which a screening program can play an important role in early detection and thus dramatically reduce the mortality rate.

In this early study, we have approximately 260,000 registries of women in the central region of Portugal. The main objective of this study is to profile the population in these 12 regions in terms of the following variables: Age, Screening Date, Age of Menarche, Age of Menopause, Hormone Replacement Therapy, Pregnancy Status, Nursing Status, and Contraceptive Pills. Since the breast cancer risk can be associated with several reproductive factors, such as, early menarche and late menopause ages, we explore the possible association between these variables, the date of birth and region where these women live.

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MAIN SCIENTIFIC AREA:
Biochemistry

Bioelectrochemistry

The use of voltammetric techniques is well proved as powerful tools when applied to the study of metalloproteins and metalloenzymes. Unlike the more conventional and widespread use of potenciometric titrations, voltammetric methods allow *in situ* measurements of reduction potentials together with the acquisition of information about the kinetics of the electrode reactions as well as of relevant parameters of coupled reactions including catalysis. In fact, a broad range of information can be obtained by these methodologies that quite overpass the "static" utilization of the technique. The study of electron transfer (intra and intermolecular), recognition of redox partners and the observation of catalytic currents, for example, puts the voltammetric methods on a dynamic range of utilization.

The aim of my work is to explore metalloproteins and metalloenzymes by bioelectrochemistry, in a dynamic approach, in order to obtain kinetic and mechanistic information about these systems.

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MAIN SCIENTIFIC AREA: Biochemistry

Cellular Detoxification and Iron Metabolism

Our goal is to understand the mechanism of some of the enzymes which are of vital importance in iron metabolism, cellular detoxification and DNA protection from oxidative stress – the ferritin family. Three types of ferritins are identified in bacteria: the archetypal ferritins, also present in eukaryotes; the heme-containing bacterioferritins, only found in eubacteria; and the Dps (DNA protection during starvation) proteins, only present in prokaryotes. Ferritins, in general, serve the dual functions of iron detoxification and storage; they catalyze the oxidation of the toxic Fe^{2+} ions in the cells to the less toxic Fe^{3+} ions (ferroxidation) and store the oxidized Fe^{3+} ions within its protein shell in a mineral form similar to ferrihydrite (mineralization). The global biologic function of ferritins can be described as the iron entry, ferroxidation and mineralization, and the iron release. Although DNA and protein sequences for ferritins vary, the tertiary/quaternary structures are highly conserved, in which 24 subunits for the maxi-ferritins (approximately 480 kDa) or 12 subunits in the case of the bacterial Dps proteins (approximately 240 kDa) assemble to form a spherical hollow nanocavity (5-8 nm in diameter), where the oxidized ferric iron is stored in a solid mineral form (also named core) at concentrations approximately 1e14 higher than aqueous ferric iron concentrations. The maxi-ferritins (bacterial ferritins and bacterioferritins) can accumulate up to 4,500 iron atoms, while the mini-ferritins can only accommodate about 500 iron atoms.

NAME: Smilja Todorovic
UNIT: ITQB
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MAIN SCIENTIFIC AREA:
Biophysical Chemistry

Raman Spectroscopy of Metalloproteins

Our research is focused on the biophysico-chemical aspects of the functioning of various metalloproteins. In particular, we are interested in understanding how different proteins fine-tune the reactivity of their metal cofactors and additionally, how the metal centres help to define the functional features, dynamics and stability of protein molecules. We use resonance Raman spectroscopy on a wide variety of structurally and functionally different proteins, in order to access the details of the interplay between the protein matrix and the metal.
Resonance Raman spectroscopy of the heme, blue copper, non-hemic iron and iron-sulfur proteins that we study can reveal highly specific and sensitive information on discrete metal site(s) within a protein. It is capable of providing information on: the thermodynamic parameters that control electron transfer in redox proteins, the ligation pattern of the metal center that determines the enzyme rectivity, or short-lived intermediates of the catalytic cycle of an enzyme. In time-resolved mode, resonance Raman spectroscopy allows us to study protein dynamics and structure simultaneously over a broad time scale, from nanoseconds to hours. We are also interested in comprehending the parameters that control the redox properties of respiratory chain complexes. Bacterial complexes are excellent model systems for understanding the functional features or disorders of the mammalian ones, while surface enhanced resonance Raman spectroscopy allows the studies on proteins embedded into biocompatible monolayers that mimic a physiological membrane.

NAME: Wagner VALENTE
UNIT: UIED-FCT-UNL
EMAIL: wrv@fct.unl.pt
MAIN SCIENTIFIC AREA: Education

NEW MATHS IN BRAZILIAN AND PORTUGUESE CLASSROOMS: COMPARATIVE HISTORIC STUDIES

To reflect about reforms in the teaching of mathematics, in times past, in order to better understand and carry out present proposals for change, constitutes the perspective adopted in this project. To this end, its aim is the realisation of comparative historic studies between Brazil and Portugal in relation to the reception of the New Maths Movement, in the pedagogical practiced of the two countries. The project includes the organisation of digitalised databases of documents which will make possible the comparative historic analysis. It also includes plans to publish the results of these investigations in books and in international research journals.

NAME: Alain Véron*
UNIT: I3N/CENIMAT
EMAIL: arv@fct.unl.pt
MAIN SCIENTIFIC AREA: Physics of soft materials

Computer Simulation of Liquid Crystals

Liquid crystals are materials that macroscopically flow like liquids while at microscopic level, because of their molecular structure, they exhibit some orientational order like crystals. In many systems it is the rigid rod-like shape of the molecules that favours the microscopic alignment.

These fluids exhibit the following macroscopic properties: (i) the flow disturbs the molecular orientation, (ii) the molecules rotate when subjected to an external electric or magnetic field, (iii) the rotation of the molecules may induce a flow and (iv) the optical properties are determined by the molecular orientation. Thus the coupling between the translational and the orientational motions of molecules as well as the coupling with external fields lead to unusual and rich flow behaviours.

Forty years ago a theory describing nematic liquid crystals within the general framework of continuous medium dynamics has been proposed by Leslie and Ericksen and is widely used to analyse the experimental data. Five viscosity coefficients and three elastic constants are necessary to fully characterise these fluids (instead of one viscosity for classical liquids). On the other hand this theory introduces two coupled equations of evolution, one for the velocity and the other one for the director that describes the local mean orientation of the molecules. Except for very particular cases the equations cannot be solved analytically but only numerically. We have written a Fortran program solving the Leslie-Ericksen equations in 2D domains and we will present some numerical results.

(*) *Work done in collaboration with Professor A. Farinha Martins*

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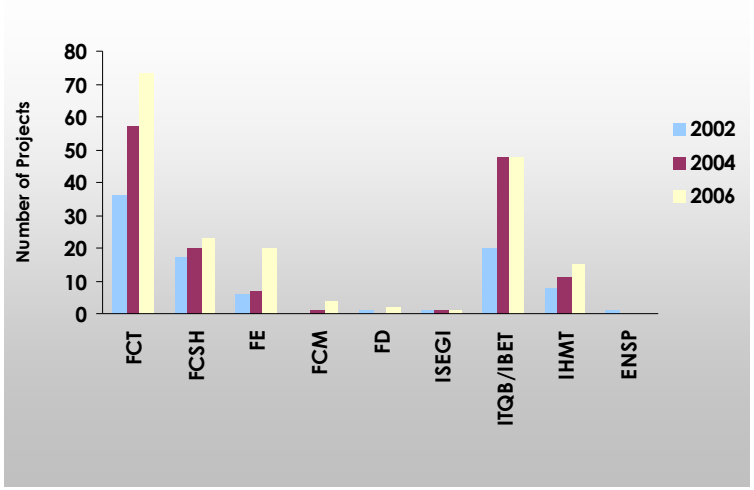
Annex 5.10
Research funding

ANNEX 5.10 RESEARCH FUNDING

5.10.1 PROJECTS FUNDED BY FuCT from calls of 2002, 2004, 2006



5.10.2 FUNDING OBTAINED FROM PUBLIC AND PRIVATE RESEARCH PROJECTS/CONTRACTS (2005-2007)

Table 10.1

Unit	FuCT pluriannual Fund#	Fund FuCT Projects*	EU Fund*	Other Public Fund*	Total Public Fund*	Private Fund*	Total Fund*
FCT	7.022.183,79	11.450.242,09	8.176.816,94	10.078.018,20	36.727.261,02	1.303.507,20	38.030.768,22
FCSH	3.342.422,12	3.138.542,29	897.837,57	6.368.266,31	13.747.068,29	1.159.055,77	14.906.124,06
FE	623.439,12	1.003.935,77	208.580,00	0	1.835.954,89	354.516,88	1.835.954,89
FCM	368.103,00	802.869,20	256.886,72	180.507,26	1.608.366,18	856.376,38	2.464.742,56
FD	259.892,85	209.445,00	0	39.500,00	508.837,85	296.389,54	805.227,39
ISEGI	52.381,00	216.644,00	57.840,00	1.132.891,00	1.459.756,00	678.540,00	2.138.296,00
ITQB/IBET	3.792.928,12	22.348.328,18	8.654.799,60	799.377,28	31.802.505,10	5.778.508,22	37.581.013,32
IHMT	404.101,08	1.866.829,34	1.175.098,15	727.919,32	4.173.947,89	761.942,49	4.935.890,38
ENSP	0	0	93.153,67	2.247.712,36	2.340.866,03	618.273,51	2.959.139,54
TOTAL UNL	**15.605.558,23**	**41.036.835,87**	**19.521.012,65**	**21.574.191,73**	**97.737.598,48**	**11.807.109,99**	**109.544.708,47**

FuCT: pluriannual funding of Research Units granted in 2005, 2006 and 2007 excluding the salaries paid to researchers in the ALs.

***** Total funding raised from projects/contracts that were running in 2005 and/or 2006 and/or 2007 but may have started before 2005 or will finish after 2007.

5.10.3 RESEARCH EXPENDITURE 2007

Table 10.2

Unit	Projects/contracts	Pluriannual	Total
FCT	6.074.566,19	2.770.952,81	8.845.519,00
FCSH	4.149.774,13	923.265,08	5.073.039,21
FE	114.009,15	234.000,00	348.009,15
FCM	311.060,75	88.646,75	399.707,50
FD	18.392,75	26.941,45	45.334,20
ISEGI	796.446,00	21.887,37	818.333,37
ITQB/IBET	6.632.263,72	1.364.509,16	7.996.772,88
IHMT	1.153.117,11	275.734,08	1.428.851,19
ENSP	841.447,74	0	841.447,74
TOTAL UNL	**20.091.077,54**	**5.705.936,70**	**25.797.014,24**

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Annex 5.11
Doctoral programmes

ANNEX 5.11 DOCTORAL PROGRAMMES

5.11.1 ORGANISATION OF DOCTORAL PROGRAMMES AND FORMAL REQUIREMENTS FOR THE AWARDING OF THE DEGREE

All FCT Doctoral programmes have been recently reformulated in the context of the Bologna process, towards the establishment of regular third cycle academic programmes. This process induced a clear shift from the traditional PhD organization in national universities, which used to focus on particular research plans agreed between students and supervisors, towards the definition of formal academic programmes with structured *curricula*. Thus, all FCT new programmes include formal course requirements, involve several milestones and quality control procedures, are supervised by coordination committees with well-defined responsibilities, and are therefore more easily comparable in the international context. Doctoral programmes adhering to this general structure are not new in FCT (for example, the Programme in Materials Science and Engineering), but currently all courses fit in this general framework; the same guidelines are expected to apply to all PhD programmes to be set up in the future. The duration varies between 3 to 4 years for full-time students, with minor deviations allowed, depending on special justification subject to approval by the scientific committees. This accounts for a total of 240 ECTS, which may include several courses, equivalent to 30 to 60 ECTS, depending of the specific regulation approved for each programme. These courses are specific to the PhD programme, corresponding to advanced or "star" courses in fundamental scientific or technical topics. Some programmes also offer courses in soft skills, such as scientific and technical communication, as well as research seminars. The remaining ECTS are dedicated to the research programme and to the dissertation writing. Depending on the programme, 12 and 24 months after registration the PhD students have a mandatory public seminar to report the status of their research work and present a proposal for the PhD thesis plan, to be evaluated by the thesis Advisory Committee. Admission to the dissertation phase is only granted after completion of a certain number of courses, and in some programmes, after approval of the PhD thesis plan by the Scientific Committee.

FCSH has recently made its own regulation for a 4-year doctoral program (1 year courses + 3 years dissertation), within the framework of the general PhD regulation of UNL. The main features are: 1. Students must obtain a stipulated minimum of ECTS credits in methodological and advanced theoretical or thematic seminars in the area of the PhD; 2. The dissertation advisor is designated during the second semester by the scientific committee of the program; 3. At the end of the second semester, each student will present his/her PhD research project/state-of-the-art in the form of a Final Report to a panel of professors, which upon being approved confers a number of credits and enters the student into the research/dissertation phase of the program; 4. PhD programs are associated to research units of the FCSH or other universities on a protocol basis, where they can be integrated in specific research projects (10 ECTS credits can be obtained within the research unit); 5. PhD students have either a regular student status, or a part time status by which they dispose of 50% over the regular time to complete the doctoral thesis; 6. International mobility of PhD students is still rather limited, since Bologna PhD programs are yet relatively few, and international partnerships must be developed in the near future. Post graduate programs like Erasmus Mundus and UNL/Austin Texas are already some good examples of mobility. This overall framework leaves full liberty for disciplinary differences to be reflected in course contents and style of research, and for the different areas to define the connections they aim at between the PhD research projects and the existing research centres and teams.

FE has a 5-year study cycle that will give students access to awarding of the Doctor degree. The program includes a Research Masters, which is divided into 2 years of course work, followed by 3 years of Doctoral Research Program for the research work and additional specialized studies. Course requirements are different for the Economics and Finance programs. The admission to the research phase is conditional on the approval of a comprehensive exam in economic theory or in financial theory (according to the program), which tests the strength and scope of the candidate's education, ensuring that only those who are genuinely prepared to conduct research will proceed. Typically, candidates are admitted to this exam only after having completed the academic part (formal lectures and class work) of the first two years. Only upon approval in these comprehensive exams with (at least) the grade of GOOD, may the applicant be admitted as a doctoral candidate and allowed to begin to work on the dissertation, an original piece of work prepared under the supervision of an academic advisor. During the research phase, students should complete one research paper until the end of the first year of the doctoral program. This research paper can be one of the papers that will be part of the doctoral dissertation or an elaborate dissertation proposal and should be conducted under the guidance of the respective doctoral supervisor. Students that studied the two years of course work at the FE will be able to obtain a Research Master in Economics degree with this work. Students should focus on one area in the beginning of their third year and are expected to start research from that moment onwards. Formal specialized courses will be offered in the first semester of the first year of the research phase. Each student should attend the course that is closest to his/her area of interest under the guidance of the respective advisor. Specialized workshops will also be organized throughout the year. Research-phase students, regardless of their year, must attend at least one workshop per semester. At these workshops, faculty, students and visitors present preliminary and completed work as well as surveys of the state of the art in particular topics. First-year students are expected to present surveys and their research agenda, whereas more advanced students are

expected to present research in progress. The offer of courses and workshops will be decided by the Program Director prior to the beginning of each academic year, taking into account students, interests and the School's research capacities. Doctoral candidates are required to attend INOVA research seminars unless they are studying abroad. The Doctor title will only be granted to students who have two full years (4 semesters) of participation in INOVA seminars.

At FD the PhD candidate has three semesters of seminars and thesis topic choosing; presentation of thesis plan to a panel of professors; presentation of research to faculty in seminars, submission of thesis to panel (usually 5-7 professors, including some from other institutions).

At FCM, until the end of 2008, doctoral education stood on traditional individual training. PhD students were orientated by a PhD of FCM or by researchers from recognized national or international institutions, and had to develop an original research programme. FCM has recently submitted two new doctoral programmes in accordance with the Bologna recommendations, but will maintain a mixed model during a transition period. One of the programmes will award a doctoral degree in Medicine and the other in Life Sciences. Both may be developed in 3 different scientific areas: Biomedicine, Clinical Research and Mental Health. The duration of these programmes is 4 years in full-time or up to 8 years in part-time. The doctoral programme corresponds to 240 ECTS: 1) Doctoral course: 35 ECTS (10 in mandatory areas and 25 in optional areas) and 2) Thesis in Biomedicine, Clinical Research or Mental Health: 205 ECTS. Portuguese general regulations for PhD Studies and UNL regulation nº 265/2007, state the general prerequisites and procedures concerning the award of doctoral degrees by the UNL. The FCM Doctoral programmes are regulated by FCM regulation 292/2008, which takes into account its specificities. This set of rules define the general organization of the programme, access and admission criteria, fees, preparation of the programme and submission of the overall plan and final presentation, constitution of the jury, and classification in the different scientific areas. Furthermore, it includes the duration and management of the doctoral studies, as well as scientific supervision.

ITQB has recently revised its PhD program, adapting it to the Bologna regime. The PhD corresponds to a total of 240 ECTS credits, which are mostly dedicated to research leading to an original thesis (210 ECTS, with the remaining 30 ECTS for courses – formal and informal). Some formal teaching is included, mostly contained in three scientific and technological courses in the areas of chemistry, structural biology, cell biology, microbiology, and biotechnology. The objective is to reinforce the scientific culture of the students, but also to provide some training in soft skills. Science & Society, as well as Bio entrepreneurship, are areas that deserve special attention in order to open the student's minds to the world beyond academia and to provide them with soft skills. These are the subject of two courses. Research training is also provided for students that have not selected a supervisor at the start of the program. Additionally, the students can obtain some credits on other formal courses from other institutions or to other, non-formal, ways of learning.

At IHMT the program is reasonable and based upon national legislation but it misses competition with other countries in how it facilitates bringing in foreign students, mainly from Portuguese speaking countries, in a large number, where the concept the groups and themes can be better invested for the future.

ENSP runs only one doctoral programme in Public Health, although candidates specialize in one of five areas: Epidemiology, Health Promotion, Environmental and Occupational Health, Health Policy, Management and Administration or Health Economics. Up to now, this has been a research-based programme with candidates opting, on an individual basis, to frequent disciplines available on the Masters courses. There is only one compulsory module, the Doctoral seminar held once monthly. From 2009/2010, candidates will initially enroll for a Doctoral course lasting one year (60 ECTS).

5.11.2 SUPERVISION

At FCT the PhD students must get involved in research as soon as possible in the programme, under the supervision of a faculty member and researcher. In some cases, the student supervision is also ensured by a co-supervisor that may be affiliated with other institution. The supervisors (professors or senior researchers) have the responsibility of advising the student, supervising the research work, and providing the conditions for the activities to progress as planned, in collaboration with the PhD Programme management structure. Supervisors are formally appointed by the programme Scientific Committee, usually resulting from a match making process between students and candidate advisors. Some programmes provide students with a tutor during the early phase: the tutor is a faculty member that acts as a provisional supervisor, who advises the student in the first semester or year of the programme, while he/she still has not yet chosen the research topic and supervisor. Each PhD student has a thesis Advisory Committee, comprising at least two members (one external to FCT) which approves or suggests changes to the thesis plan and follows its progress until submission.

At FCSH a tutor is assigned to the student for the first two semesters of the doctoral program. A supervisor will be appointed for each student by the end of the second semester, after successful completion of the seminars and after the Final Report had been submitted and accepted by a board of three examiners. The supervisor is

appointed by the scientific committee of the doctoral program according to the specific scientific area of the student's research project. His/Her role is to advice on all matters related to the research and writing throughout the last four semesters of the doctoral program.

Students at FE should have a doctoral dissertation supervisor assigned by the end of the first semester of the first year and are encouraged to enter the research phase already with a proposed topic and a supervisor. It is up to the supervisor to evaluate the student's performance at the end of each year. The supervisor may recommend to the Program Director that a student should be discarded from the program. Students are encouraged to complete the research phase in three years and have a maximum of four years to finish it. The only exceptions will be in cases of proved illness. The advisor is responsible for the placement process of their students, coordinating with the direction of the program the efforts to that effect.

At FD the supervisor discusses the topic and checks on student's progress regularly. He/she will be on the panel that evaluates the final result (dissertation).

To prepare and implement the doctoral course at FCM, a coordinator is nominated by the scientific council. The coordinator must help the PhD student to choose among the different units of the course, according to his learning needs and objectives of the scientific project he wants to develop for his thesis. The preparation of the thesis must be accompanied by a supervisor, proposed by the candidate and approved by the Scientific Council. Every year the student has to submit a progress report including papers published or accepted for publication. The supervisor should also prepare information about the overall progress of the project. Both reports will be evaluated by the Scientific Council, which may request 2 external reviews. Then the Scientific Council will decide on the renewal of grants, scholarships, and financial support for the participation in scientific meetings. The Scientific Council may also ask the student to prepare an annual seminar on a particular aspect of the project and can determine the cancellation of the project if quality criteria are not met, after revision by two external reviewers.

Every PhD student at ITQB works under the responsibility of a senior researcher, who has the duty of supervising the student's research and provides him/her with the necessary conditions to develop the PhD project. Master students have also a thesis supervisor, who is, in most cases, a senior researcher. All new ITQB PhD students have a thesis committee. This committee has to meet with the student at least two times during the PhD, ensuring that the proposed research is progressing as planed and suggesting changes for improving the process.

At IHMT the role of the advisors is crucial for the success of the dissertation and the tutorial commission has 3 members.

Each candidate at **ENSP** is assigned one or two supervisors whose role is to provide scientific advice on thesis development. Besides this, each candidate is assigned a thesis advisory committee made up of three members whose role it is to complement the supervisor(s) in terms of scientific advice as well as to carry out various administrative duties. The thesis advisory committee is chaired by the supervisor. One member of the committee (and one of the supervisors if there are two) can be from outside the School.

5.11.3 RECRUITMENT CRITERIA AND ADMISSION REQUIREMENTS OF PhD STUDENTS

FCT - PhD candidates must have a Masters degree or a graduation level equivalent to 240 ECTS or more. Usually, they are also required to demonstrate a certain undergraduate or master level grading level (generally at least 16/20). When the candidate does not fulfil some of these requirements, he/she might still be admitted to a specific doctoral programme, depending on the recognition of his/her competences by the Scientific Council of FCT, a decision based on the academic, scientific and/or professional curriculum. In addition to these requirements, admission of candidates to the Doctoral programme may require previous approval on one or two bridging courses, depending on the programmes specific regulations. The bridging courses offer the candidates the opportunity of overcoming weaknesses in their background and are usually required for candidates with undergraduate education in a different scientific area.

FCSH - PhD students must fulfill at least one of the following admission requirements: have a Masters degree, postgraduate level and a CV recognized by the Scientific Council of FCSH as being scientifically relevant for doctorate studies, or a scientifically relevant CV. When a student does not hold a Masters degree but fulfills one of the other requirements, acceptance is based on the reports of two specialists in the scientific field of the doctoral program. Applicants who meet the criteria are ranked by a jury on the basis of their academic and scientific CV and selected according to the available vacancies**.**

FE - Students are required to hold an undergraduate degree in Economics or a related area in order to apply to a program. Students that enroll in the Doctoral Program holding already a M.S. degree in the area may be exempted from the first-year courses, or part thereof. In exceptional cases, candidates may be even exempted from some second-year courses, provided they have sufficient background. The admission to the research

phase is conditional on the approval of a comprehensive exam in economic or financial theory (depending on the program), which tests the strength and scope of the candidate's education, ensuring that only those who are genuinely prepared to conduct research will proceed. Typically, candidates are admitted to this exam only after having completed the academic part (formal lectures and class work) of the Research Masters. Only upon approval in these comprehensive exams with (at least) the grade of GOOD, may the applicant be admitted as a doctoral candidate and allowed to begin to work on the dissertation, an original piece of work prepared under the supervision of an academic advisor.

FD - The student must have completed second cycle (Masters), have an honours degree or a significant academic/professional *curriculum vitae*. A panel of professors evaluates the candidates, including an interview if considered necessary, and the results of panel deliberations are available to all candidates.

FCM - According to the set of recommendations issued by the Treaty of Bologna, a third study cycle can be achieved after a second study cycle or after a first study cycle that includes a study plan equivalent to 240 ETCS or more. Other ways of access include first cycle students with a relevant academic and scientific curriculum, or students with an academic curriculum recognized by the Scientific Council has being acceptable as a base for a doctoral programme. The Scientific Council may ask for an external evaluation by two experts in the area. In order to stimulate clinical research in Portugal and young clinicians to pursue PhD programmes, the Government created a special programme for trainees, which allows them to articulate their clinical preparation with a doctoral programme (*Portaria* nº 172/2008).

ITQB - Recruitment of PhD students is mostly done by senior researchers. The institutional leadership approves the applications for PhD fellowships, which will be evaluated by the Portuguese Research Council using criteria related with the merit of the candidate, the merit of the institution (including the supervisor) and the merit of the proposed work program. The coordinating committee of the scientific council approves thesis committees.

IHMT - Needs urgent changes and facilitation, otherwise there will be always little impact from this University in bringing in foreign students or facilitating mobility in and out of the country.

ENSP - Candidates have to hold a first degree in a suitable subject. Invariably, they also hold a Masters degree. The School follows national legislation for the selection procedure.

5.11.4 FUNDING ISSUES

The amount of tuition fees varies among the units. Approximately half of the doctoral candidates at UNL receive a grant from FuCT that includes the payment of an allowance to the institution for registration, tuition or fees. A minority of PhD candidates is supported by grants from other institutions, public or private. Some units have internal scholarships (FCSH, ENSP); at FCM, the special PhD programme for clinical registrars will include, from 2009 on, a salary similar to clinicians, supported by the Ministry of Health and the possibility of obtaining a 3-year extension funded by FuCT. Resorting to bank loans is a private decision of the students, which is becoming more common.

5.11.5 THE DOCTORAL CANDIDATE'S LEGAL STATUS

Doctoral candidates who receive a grant from FuCT have a status granted by the laws of the Republic: they are considered students and have a certain number of duties and rights established by these laws (benefit from National Health Service, maternity leave, and a minimum pension scheme, but they are not entitled to unemployment benefits). Under some circumstances, they can help in teaching or participate in practical lectures. In the cases where the doctoral candidates are employees (university or other institution), they have all the inherent rights, including unemployment benefits.

5.11.6 EUROPEAN/INTERNATIONAL DIMENSION IN DOCTORAL PROGRAMMES

Mobility is not compulsory but strongly encouraged by all units and some provide financial support, for instance to attendance of international meetings or short and medium term stays abroad. A number of PhD students are supervised in a co-tutelle scheme and in some cases the candidate obtains a degree simultaneously awarded by UNL and a foreign university. In the Erasmus Mundus PhD mobility programs, currently being developed at the FCSH, the student will be entitled to a multiple diploma delivered by the European universities belonging to the *consortium* where he/she has registered.

5.11.7 CAREER PROMOTION/COUNSELLING

Career counseling is mostly informal and provided by the supervisor(s); however, some units such as FCSH and FE provide specialized aid for students wishing to apply for the national or international job market.

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Annex 5.2
Research areas and activities of Associate Laboratories and Research Centres

ANNEX 5.2 RESEARCH AREAS AND ACTIVITIES OF ASSOCIATE LABORATORIES AND RESEARCH CENTRES

5.2.1 ASSOCIATE LABORATORIES

Instituto de Tecnologia Química e Biológica (ITQB, www.itqb.unl.pt), Associate Laboratory of Oeiras with the Instituto de Biologia Experimental e Tecnológica (IBET) and the Instituto Gulbenkian de Ciência (IGC). The areas of competence of the AL are:

- Biologically active molecules;
- Molecular medicine and veterinary medicine;
- Developmental biology in animals and plants;
- Biological risk;
- Plant and forest improvement.

It congregates 566 researchers (220 PhD holders)

Centro de Investigação em Materiais da FCT/UNL (CENIMAT, www.cenimat.fct.unl.pt), integrates the Associate Laboratory Instituto de Nanoestruturas, Nanomodelação e Nanofabricação - I3N (www.i3n.org), together with the Instituto de Polímeros e Compósitos (IPC) of Universidade do Minho and the Unidade de Física de Semicondutores em Camadas, Optoelectrónica e Sistemas Desordenados (FSCOSD) of Universidade de Aveiro. The areas of competence of the AL are:

- Micro- and nanofabrication;
- Micro- and nanostructured materials;
- Multi-scale modeling;
- Physical characterization.

209 researchers (108 PhD holders)

Centro de Química Fina e Biotecnologia da FCT/UNL (CQFB, www.cqfb.fct.unl.pt), together with Centro de Química da Universidade do Porto integrates the Associate Laboratory de Química Verde – REQUIMTE (www.requimte.pt), the largest network in Chemistry and Chemical Engineering established in Portugal. The areas of competence of the AL are:

- • Natural Products: Screening and Synthesis;
- Food Quality and Safety;
- Clean Production Technologies and Processes;
- Environmental Control and (Bio) Remediation;
- Catalysts, solvents and non-toxic compounds.

377 researchers (178 PhD holders)

Centro de Malária e outras Doenças Tropicais (CMDT-LA, www.cmdtla.org), was established in 1992 as Research Centre of the Institute of Hygiene and Tropical Medicine, under the auspices of the FuCT. Since December 2004 it was awarded the status of Associate Laboratory. 78 researchers (28 PhD holders)

Its primary goal is excellence in research and development in the field of Tropical Health, covering all aspects of tropical health (public health, medical, biology, molecular epidemiology and social sciences), with particular emphasis on diseases of poverty and neglected diseases.
We have assembled a strong group of scientists from different nationalities, with different skills that apply in the research and lines that converge in CMDT-LA joint actions, including pre- and post-graduate training, master and doctoral programs, development and implementation of control programs of disease, health education, among others.

5.2.2 RESEARCH CENTRES AGGREGATED BY HOST INSTITUTION (Acronym/Webpage/Classification in the last evaluation of FuCT – when applicable)

5.2.2.1 FACULDADE DE CIÊNCIAS E TECNOLOGIA

Centro de Física e Investigação Tecnológica (**CEFITEC / http://cefitec.df.fct.unl.pt / VERY GOOD)** is a research centre dedicated to Physics, Physics Engineering and Biomedical Engineering. Main areas of R&D are:

- Surface and Interface Physics and Technology (Thin films, Catalysis, Interface processes at the molecular level, Surface spectroscopies);

- Advanced Materials (Insulator and wide band-gap semiconductor oxides, magnetic and superconducting materials, nano-structures and liquid crystals);
- Atomic and Molecular Interactions (processes in environmental and biological molecules; molecular beam interactions, relativistic auto-consistent studies of atoms and molecules);
- Biophysics and Biomedical Engineering (Protein studies, Elemental analysis of biological tissues; UUV irradiation to biomolecules; Medical instrumentation and diagnose methods; RMN imaging in medicine; hemodynamics; transport phenomena in biological tissues; Monte-Carlo simulations applied to Radiotherapy; Skin substitutes;
- Instrumentation (Cryogenics Instrumentation; Experimental demonstration devices for Physics classes; medical instrumentation);
- Nuclear Reactions and Techniques (Reactions relevant to Nuclear Astrophysics; nuclear reaction based analytical techniques);
- Optics, Optoelectronics and Lasers (Multi photon ionization, Non linear optics, instrumentation based in optical spectroscopies; solid-state lasers).

Centro de Investigação em Geociências Aplicadas (CIGA / VERY GOOD) and **Centro de Estudos Geológicos (CEG / VERY GOOD)** were merged into the single centre **Centro de Investigação em Ciência e Engenharia Geológica** in the end of 2007 (**CICEGe, www.cicege.fct.unl.pt**). The main areas are:

- Exploitation and modelling of earth resources and interaction between geological and economical data;
- GIS applied to planning, management of earth resources and remediation of contaminated sites;
- Geotechnical studies for civil engineering, territorial planning and environmental preservation;
- Alterations of igneous and metamorphic rocks while exposed to natural aggressive environments or induced by man; experiments on silicate and carbonate rocks and dimension stones;
- Specific properties of industrial rocks and clay minerals for correct use in the industry;
- Palaeontology, stratigraphy and geological mapping of Meso-Cenozoic;
- Basin analysis;
- Geological heritage and geoscience diffusion.

Centro de Investigação em Materiais (**CENIMAT / www.cenimat.fct.unl.pt / EXCELLENT***)* is a research centre that promotes excellence in materials research and technology (covering nanoscience and nanotechnology research) within the field of Materials Science and Engineering, which includes semiconductors, polymers, coatings, metals, ceramics, glasses and composite materials. Recently, it has become part of the newly created Associate Laboratory Institute of Nanostructures, Nanomodelling and Nanofabrication (I3N). CENIMAT supports service to industry and research in the area of materials by providing the facilities and the necessary expertise to carry out research, training, and development programmes in the above mentioned fields. It is organized in 4 research groups composed of PhD's researchers, Postdoctoral and PhD's students, besides technicians and administrative staff:

- The Dielectrics Materials and Structures Group devotes its research activity to the preparation and characterization of polymer electrets, piezo and pyroelectric polymers, ceramics and composites, electroactive polymer-ceramic composites, smart sensors and adaptative structures, biossensors, polymer ageing and degradation and biodielectrics (such as cork);
- The Electronics and Microelectronics Materials Group performs R&D activity in the areas of: nanotechnologies, thin film processes (semiconductors, conductive oxides and insulating materials); microelectronic processes (including all the technology for IC and device fabrication) and energy conversion (solar cells, systems and social implications);
- The Polymeric and Mesomorphic Materials Group;
- The Structural Materials group develops research within the areas of physical metallurgy, metal matrix composites, processing of ceramics, extractive metallurgy, recycling of materials, crystallography and crystal chemistry.

Centro de Inteligência Artificial (**CENTRIA / http://centria.di.fct.unl.pt/ VERY GOOD**). Its current goals of can be divided in three main areas:

- Logic Programming and its application to Knowledge Representation and Reasoning;
- Intelligent Information Systems, covering topics from semantic web definition to natural language and information retrieval from intelligent Information systems;
- Soft Computing and Constraints, including AI in Medicine and Bioinformatics.

Besides the research efforts implied by our goals, current CENTRIA activities involve education, such as the European MSc in Computational Logic (2004, and ongoing), and interdisciplinary research collaborations, such as the BIOINFO proposal for positions in a project involving Informatics, Structural Biochemistry,

Molecular and Cell Biology, Materials Science and Physics and the GEOINFO proposal for the development of techniques to analyze oceanic mesoscale phenomena. CENTRIA is also presenting an Associate Laboratory proposal.

Centro Inter Universitário da História da Ciência e da Tecnologia (**CIUHCT / VERY GOOD**) aims at promoting research in the History of Science and Technology according to international standards of scholarship and at contributing to the development and consolidation of this discipline in Portugal. The unit aims at articulating discussion at the conceptual and methodological levels with research on specific topics especially focussed on, but not restricted to, Portuguese history. In any case this focus does not preclude the integration of Portuguese research in international groups and initiatives. On the very contrary we consider our main mission to present our local case studies in a format appealing to an international audience. Furthermore, the unit aims at contributing to the consolidation of a strong scientific community by actively participating in the education of students (graduate and post-graduate level) as well as by enrolling in outreach activities (popularization, exhibits).

Centro de Informática e Tecnologias da Informação (**CITI / http://citi.di.fct.unl.pt/ VERY GOOD**). Its mission is to promote basic and applied research in Computer Science and Informatics. The CITI research team is currently composed by more than 50 researchers, of which around 40 are PhD holders. While the vast majority of its members are FCT/UNL faculty, CITI has also acted as an attraction pole for researchers from nearby universities. The centre has been (2004) rated “very good” in the evaluations organized by FuCT, and was by then considered by the referees as the research unit, among those assessed, that featured a more intense feeling of community.
The research directions at CITI cover a wide spectrum of themes, ranging from the foundations and models, programming languages and software architectures, to parallel and distributed computing systems, multimedia, graphics, interaction, and human language technologies and tools. Such a broad coverage of scientific themes, in close connection with the graduate and undergraduate teaching mission of our host Department of Informatics is a distinctive aspect of CITI.
Regarding graduate activities, CITI members participate in the MSc and PhD programs of the Department of Informatics/FCT/UNL, as well as the Dual Degree PhD Program in Computer Science (Carnegie-Mellon University / UNL). A new joint PhD program in Digital Media is being prepared in collaboration with University of Texas - Austin.

Centro de Investigação em Ambiente e Sustentabilidade (**CENSE**). This recently created centre (not yet evaluated by FuCT) is devoted to the promotion of interdisciplinary research in environmental sciences and engineering, focusing in the interaction between human and ecological systems, to promote sustainable development. It is the research branch of a wider organization including researchers, students and staff from the Departament of Environmental Sciences and Engineering of FCT/UNL, plus a number of affiliated organizations (teaching and research, business and public organizations). CENSE develops its activities through the promotion of research projects, outreach initiatives, training programs, collaboration with private and public organizations, dissemination of results and science-policy dialogues. Its funding is obtained from national and internationally funded research programs, as well as from other sources from public and private sectors. It is organized in four research groups:

- Ecological economics and environmental management – governance, participation, policy instruments, valuation of ecosystem services and ecological-economic modelling;
- Information and communication technologies – design of algorithms and human-computer interfaces for interactive visualization and spatial data infrastructures;
- Climate change and sustainable energy – study of vulnerabilities on biophysical systems, remote sensing and modelling of water and carbon cycles and energy systems;
- Environmental assessment, monitoring and remediation – impact assessment, air quality, water treatment and remediation. Study of biophysical processes and tools linking environmental engineering, biotechnology, molecular ecology and bioinformatics.

Centro de Matemática e Aplicações (**CMA / www.dmat.fct.unl.pt / GOOD**). Research at CMA covers, non exclusively, the following topics: Algebra, Linear and Multilinear Algebra, Algebraic Geometry, Combinatorics, Matrices and Graphs, Ockham algebras and semigroups, Languages and Automata; Ordinary and Partial Differential Equations, Singular Integral Equations, Numerical Analysis, Differential Inclusions, Dynamical Systems, Calculus of Variations, Asymptotic Analysis, Continuous Media Mechanics; Statistics, Linear models, Analysis of variance, Droughts Management, Distribution Theory, Near-exact distributions, Likelihood ratio statistics, Exact distributions, Extreme value theory; Actuarial and Financial Mathematics; Mathematical Economics; Probability Theory and Stochastic Processes; Operations Research Combinatorial Optimization, Non linear Programming, Management, Simulation, Neural Networks; Mathematical Education, History of Mathematical Education.

Centro de Química Fina e de Biotecnologia (**CQFB / www.cqfb.unl.pt / EXCELLENT**) is one of the two research centres that form the largest network for chemistry in Portugal: REQUIMTE- Rede de Química e Tecnologia, a Portuguese Associate Laboratory for the Green Chemistry, Clean Technologies and Processes. The mission, objectives and activities of CQFB are common to REQUIMTE:

- Cooperate in an active, continuous, competent and efficient way for the implementation of the principles of Green Chemistry;
- Foster public awareness of key chemical and biochemical concepts, to help understand the costs and benefits of technology in the modern world and to develop a balanced global appreciation of environmental issues;
- Pursue an environmentally driven research in association with the chemical industry to develop closed loop industrial processes;
- Preserve its well-founded and successful roots in traditional chemical, biological and engineering sciences, while strengthening its international research in innovative and novel topics and to become a pool of attraction for young and well established national and international scientists;
- Contribute to a Portuguese international viewed research;
- Provide specialized services and consulting.

Centro de Recursos Microbiológicos (**CREM / www.crem.fct.unl.pt / VERY GOOD**) is committed to research in areas of microbiology, with the general objectives of contributing to the advancement of fundamental knowledge, with a view to its potential application in biomedicine, fermentative industries and agro-sciences. CREM houses the Portuguese Yeast Culture Collection, an internationally recognised yeast collection founded in 1952. CREM builds on interdisciplinary competences and promotes high quality training at the undergraduate and post-graduate levels. The research and training programmes are developed around two research lines (i) Molecular Evolution and Ecology; (ii) Interactions Microorganism-Environment.

Centro de Investigação em Genética Molecular Humana (**CIGMH / http://cigmh.unl.pt/ VERY GOOD**) congregates three Poles/Lines which develop complementary activities in the area of human molecular pathology: CIGMH-Pole 1 is based at the Department of Life Sciences at FCT/UNL, its research activity being centred on (i) Haemoglobin based disorders and (ii) Nanodiagnostics (use of nanotechnology for clinical diagnostics (materials, devices, systems) – namely on synthesis and characterisation of nanoparticles for functionalisation with DNA for the detection and capture of DNA/RNA.

Centro de Tecnologia e Sistemas (**CTS / www.uninova.pt/cts**) is the previous **Centro de Robótica Inteligente (CRI)** classified with **GOOD** in the last evaluation by FuCT) and aims to develop research recognized at international level in all the research lines and groups. The centre encourages technology transfer mostly supported by spin offs and deep involvement in international R&D projects. Scientific results are expected to contribute to improve the graduate training in the academia and contribute to internationalization of our graduate students. We participated in about 400 specific international actions as joint papers, international events organization, etc. This effort will be intensified.
Research lines and research groups have different levels of scientific and organizational development. They still operate mostly isolated from each other but with strong international links. Existing potential, as cross cooperation examples shows, anticipates the possibility of stronger in house integration and creation of scientific synergetic valor.
For microelectronics the objective besides the recent integration of new skills on materials and processes, is to embrace microelectronics (analogue and digital), telecommunications and signal processing and to make directly technology available (materials and circuits) for further developments. Hosted activities are planned to incrementally contribute to integration of research. A bridge to power circuits development was established.
Motivation supported by recent development after two years of careful preparation (under Galileo project, the EU alternative to GNSS, with ESA and CAST, the Chinese Space Agency) is to promote joint research activities in microelectronics, telecommunication and signal processing backed by UNINOVA, FCT/UNL and several aerospace Chinese Institutes. Plans to foster PhD and MSc thesis are consistent with the recent signed protocol relative to the graduating training of Portuguese engineers for activities in Galileo ground segment.
The research line on Computational Intelligence, Decision, Modeling and Control has a strong interface with space activities and with astrophysics (projects GAIA- mapping of the galaxy and Solar information system). Also pos-docs involved in data mining and knowledge discovering are meant to contribute to that research. Cooperative links have a chance to develop within the microelectronics/telecommunications merge, mainly at graduation level (new foreign PhD students). Intelligent control deals with the development of advanced control algorithms for distributed parameter systems, that is, systems modelled by partial differential equations addressing transport phenomena. An interface with space related activities is expected to occur.

Research on Collaborative Networks, hopes to contribute to establishing the topic as a scientific discipline, targeting two new domains at model formalization level: telecommunications and energy. Reference curriculum for education in CN and launching of the SOCOLNET will be pursued. The objective is the continuous reinforcement of the group reputation, strengthening it as a world reference but also to bridge activities with the two identified fields.
Concerning Interoperability, dynamic evolution of systems based on models supported by standards creates a challenge, how can interconnectivity be updated automatically still assuring conformance of information. Also research on distributed interoperable context-aware-service architectures will benefit from previous developments. Building & Construction, furniture, telecommunications and aero spatial industry will continue to be our target domains. Besides the economical, industrial and societal impact we want to continue contributing to establish a more solid and rigorous base of science in those domains of research.

Centro de Investigação em Inovação Empresarial e do Trabalho (**IET / http://iet.fct.unl.pt/ FAIR**) develops its activities in the fields of industrial sociology, ergonomics, management systems, prospective analysis in innovation, economics, and organizational studies. This interdisciplinary skill allows the unit to develop different kinds of studies, but the common technical characteristic is related to the innovative systems, at the company (networks, management, mergers and competition frameworks, quality systems, strategy), and the labour systems level (organization, labour relations, ergonomics and safety, telework. Part of the Economy and Management group develops its research activity at INOVA, the research centre of the Faculdade de Economia.

Unidade de Biotecnologia Ambiental, (**UBiA / http://gdeh.fct.unl.pt/ GOOD**). Research interests are in the field of Environmental Biotechnology. UBiA is active in complementary research areas, namely on Bioenergy and Food Safety/Quality areas. These areas are EU priority areas (7th Framework Programme) and are crucial for Portugal economy development:

- Food Technology, Safety and Quality – research subjects such as Food Toxicology, Nutritional Characterization of Food Stuffs, Food Microbiology, Plant Metabolism, Plant Physiology and Aquaculture;
- Bioenergy and Biomass – research subjects on Energetic Crops, Characterization of Biomass, Production of Biofuels (biofuel and biogas) from agroindustrial or forestry wastes;
- Environmental Control – research subjects on Water Quality, Bioremediation (contaminated water or soil), Environmental Toxicology and Ecotoxicology, Waste Management and Valorisation.

Unidade de Investigação em Educação e Desenvolvimento (**UIED / www.dcsa.fct.unl.pt/uied / VERY GOOD**) has as its main purpose to research issues related to education, training and development. The broad focus of its work lies on researching themes and problems related to educational change in formal and informal settings and its implications on social, economical, and technological dynamics. More specifically, this general objective impacts on the study of the dynamics of teaching and learning — ranging from those of specific school disciplines to those of informal learning communities —, research and development of educational technologies, investigation of programmes for the development of citizenship and its relation to science, the study of professional careers and lifelong learning, including those of teachers, and inquiry of educational policies.

Centro de Investigação em Estruturas e Construção (**UNIC / www.dec.fct.unl.pt/UNIC / GOOD**) focus its investigation activities on a well-defined selection of areas of key importance in Civil Engineering associated with the experience and knowledge of its members, namely:

- Computational mechanics;
- Parallel computing in structural mechanics;
- Dynamics of structures;
- Soil-structure interaction;
- High-speed railway infrastructures;
- Use of fibre reinforced polymers for structural strengthening, retrofitting and repair;
- Durability and ageing of concrete and composite materials;
- Pre-cast concrete structures;
- Mortar characterization and performance;
- Monitoring, conservation and rehabilitation of buildings and historical constructions;
- Hygro-thermal performance of construction elements;
- Regional and urban planning.

Research on these topics has been conducted aiming to achieve internationalization, relevance, interdisciplinarity, productivity and training of young researchers.

Unidade de Investigação em Engenharia Mecânica e Industrial (**UNIDEMI / GOOD**) aims to develop high-level research with the objective of stimulating the research work and the scientific publication, to develop advanced training programmes and to render services in the various fields of Mechanical and Industrial Engineering, namely in the areas of Product and Process Development, Manufacturing Technology and Production Strategies. The main research activity can be specified as: Product Development; Process Development and Manufacturing Systems and Strategies.

Glass and Ceramics for the Arts (VICARTE / VERY GOOD)
General objectives:

- Application of glass science in art, conservation and archaeometry
- R&D transfer to the Glass Portuguese Industry (Marinha Grande)

Research lines:
1. Luminescent glasses, paints, glazes or enamels
    - New luminescent glasses with rare-earth oxides: Ce, Sm, Dy, Eu, Tb and Tm
    - Uranium glasses in museum collections: radiological protection
    - Artwork using luminescent glasses exhibited in several countries
    - Luminescent paints, glazes, or enamels for restoration of objects (UV light)
    - Luminescent glazes for tiles (collaboration with industry)
    - Luminescent films coated over glass (future work)
2. Coloured glass
    - Ruby glass with gold nano-particles is being produced and studied
    - Gamma radiation used to reduce and nucleate gold (ruby glass)
    - Sol-gel route used to produce coloured glasses or glass foams

3. Coated glass for art or conservation
    - Films by sol-gel (future work)
    - Thin-films by spray pirolysis (future work)

4. Glass History, conservation and provenance studies
    - Systematic provenance study of Portuguese glasses
    - XVIII century shreds from “Real Fábrica de Vidros Coina” were characterized
    - Stained glass windows of the Monastery of Batalha were studied
    - Glass corrosion investigated using model glasses or glazes
    - 3D printing methods for glass conservation

5. Glass art
    - Glass artists develop studio glass works using new glass formulations
    - Ceramists use new ceramic glazes
    - 3D printing methods for glass art (future work)
    - New Master Course at start-up: Glass Art and Science
    - Glass art work from pressed recycled glass (future work)

5.2.2.2 FACULDADE DE CIÊNCIAS SOCIAIS E HUMANAS

Centro de Estudos Anglo-Portugueses (CEAP / GOOD) was recently merged with IEI, the Institute for English Studies, based at Faculdade de Letras da Universidade do Porto to form CETAPS **(Centre for English, Translation and Anglo-Portuguese Studies, http://web.letras.up.pt/cetaps/**).

Research Groups:

- British Culture and History
- Literature, Media and Discourse Analysis
- Anglo-Portuguese Studies
- Intersections in American Literature, Culture and Thought
- Shakespeare and the English Canon: a research and translation project
- Relational Forms: Intertextual and Inter-Arts Dynamics in the Cultures of Ireland and Britain
- Mapping Dreams: British and North-American Utopianism

Centro de Estudos Históricos (CEH / EXCELLENT) - Founded in 1980, the CEH–UNL (*Center of Historical Studies of the New University of Lisbon*) is dedicated to scientific research in History on a multidisciplinary perspective, with its own projects or in collaboration with other institutions. Its research is divulged throughout the scientific community in congresses and conferences in which its members participate, and also shown in publications that are the expression of its scientific activities. Although those activities cover a wide chronological span and different fields of investigation, the CEH-UNL has been dedicated in the last few years to the transcription and publication of sources for the Portuguese History, especially the records of the Royal Chancellery (*Chancelarias*) and Parliaments (*Cortes*), Medieval and Modern. This work, of undeniable importance as a platform for historiographical investigation, is even helping to reconstitute sets of related documentation spreaded in municipal or regional archives all over the country.

Research projects:

- Transcription and publication of the Chancellery records of King John I (*Chancelarias de D. João I*, XIV-XV centuries)
- Historical Atlas of Portugal and Portuguese Overseas (*Atlas Histórico de Portugal e Ultramar Português*)
- Urban and Rural Landscapes (*Paisagens Rurais e Urbanas*)

Centro de Estudos de Sociologia e de Estética Musical (CESEM / http://www2.fcsh.unl.pt/cesem/default.htm / VERY GOOD) was created in order to promote research in the areas of sociology of music and musical aesthetics, in conjunction with other disciplines in the area of the musical sciences and with social and human sciences in general. The Centre has as its objectives:

- The study of cultural heritage in the area of music in Portugal : institutions, communications systems, musicians, works, performance practice, musical iconography, including the identification, preservation and publishing of critical editions of manuscripts (scores and other documents), phonographic documents and other related media;
- The study of the socio-communicational models by means of which music manifests itself with recourse to communications theory and systems theory):
- The study of music through an aesthetic-philosophical perspective and by means of the analysis of sound material;
- Cognitive and psycho-acoustical studies, particularly of musical performance and perception;
- Research in the area of musical dramaturgy and the theory and history of different musical-theatrical genres;
- The study, from an inter-disciplinary perspective, of the relations between music and literature, music and other arts, music and scientific knowledge, music and new technology;
- The development, in cooperation with researchers in the area of information technology, of software for musical composition and analysis, as well as semantic-based knowledge systems.

Research groups:

- Historical Musicology
- Philosophy and Psychology of Music
- Contemporary Music

Centro de História da Cultura (CHC / http://www2.fcsh.unl.pt/chc/index2I.htm / GOOD). The history of ideas, putting together the perspectives of History, Philosophy and Literary Studies, is the basis of CHC's main project. Its research groups question the meanings of conceptions, doctrines or representations, considering their historicity. The research unit studies political as well as religious, scientific, economic, social, aesthetic and philosophical thought and practice, emphasizing the modern, contemporary Portuguese space and its connection with the Iberian, Brazilian and Latin-American space and the study of the forms and means of expressing and transmitting ideas.
Research Groups:

- Studies on Antiquity
- Books and Reading
- Hispanic Culture and Thought
- Free Seminar for the History of Ideas
- Political and International Studies
- Comprehension / Explanation / Language

Centro de História de Além-Mar (CHAM / http://cham.fcsh.unl.pt/ / EXCELLENT) is an inter-university research unit of FCSH and Universidade dos Açores. It develops research related to the History of Discoveries and Portuguese Expansion, as well as the Portuguese presence around the world, with a special focus for the period between the origins of the overseas expansion and the independence of Brasil (1822), with a perspective that is, as far as possible, interdisciplinary and incorporating comparative history, paying particular attention to the history of the regions with which Portugal maintained contacts.
Research Projects:

- The Nobility and the State of India in the 16th century.
- BBB - Bombay before the British. The Portuguese Legacy at the Bombay Peninsula's Territory.
- EVE - E-Cyclopaedia of Portuguese Expansion, 15th-18th centuries
- Sources for the History of the Portuguese Estado da Índia in the 17th-18th centuries. The "Colecção Junta da Real Fazenda do Estado da Índia"
- In the Name of the Honour: The Commissioners for the Holy Office and for the Military Orders in Portugal, 1570-177
- Portuguese Jesuits in East Asia in the 16th-17th centuries.
- Lower Nobility and "Nobreza da Terra" in the Formation of the Empire: the Atlantic Archipelagos. (PTDC/HAH/66107/2006)
- Portugal and South Morocco: Contacts and Clashes, 15th-18th centuries.
- PIAS - Study, Monitorization and cultural heritage valuation of the archaeological sites Angra A, Angra B, Angra E, Angra F and Angra D (Terceira).
- Portuguese Interactions with Persia during the Iberian Union (1580-1640). The "Comentários" by D. García de Silva y Figueroa

Instituto de Estudos de Literatura Tradicional (IELT / http://ielt.org / EXCELLENT) It began in the last years of the seventies germinating the idea of creating an institute based on the study of topics that were diminished by the academy; the first stage of our work ended in the eighties with the creation of an informal but enthusiastic and enterprising Institute; this led to the current academic format which was set up by 2003.
Research Groups:

- Cantos, contos... e que mais - Lullabies. Folktales and legends. Proverbs. String theatre. Other texts, other voices... Collection and analysis of edited and unpublished material.
- Tradition and Modernity - The presence of oral literature in 19th and 20th century authors. This program aims at articulating the knowledge of portuguese literature, culture and art with popular tradition.
- Falas da Terra – Ecology and Tradition - The representation of nature and environment in portuguese oral literature. Interdisciplinary comments by researchers and specialists of other areas: biology, environment, animal ethics, sociology, geography, anthropology, landscaping and bioclimatics, for example.

Instituto de Estudos Medievais (IEM / FAIR) The Institute of Medieval Studies is a research unit hosted by FCSH/UNL and funded by FuCT. It was founded in 2002, and it has as its main goal interdisciplinary research in the scientific field of Medieval Studies. Gathering in its team several investigators, both junior and senior, with different scientific backgrounds, the IEM aims to be updated and to engage in research activities in connection with other projects whose goals are to do researching on subjects and problems in medieval studies, a well as to develop scientific and academic exchanges with other national and international, public or private universities and cultural institutions involved in this field of studies. IEM aims to achieve these goals within its research groups, promoting lectures, cultural initiatives and giving online access to data resulting from the work carried out by the research groups, with particular emphasis on Hispanic, Mediterranean, and Atlantic contexts in which the Portuguese medieval society was founded and structured.

Research groups:

- History of Medieval Lisbon
- Historiography of Medieval Portugal
- Medieval Images
- Medieval Portuguese Royal Enquires
- Nobility, Urban Elites, and Military Orders
- Medieval poetry and Prose

Instituto de Etnomusicologia Popular (INET / http://www2.fcsh.unl.pt/inet/indexeng.html / GOOD) was founded in 1995 with the goal of carrying out multidisciplinary research on music from the perspective of

Ethnomusicology. Throughout its 12-year trajectory, the Institute expanded its research domains and activities, carrying out joint projects with scholars and institutions in Portugal and abroad. Its mission:

- To carry out multidisciplinary research and training on music and dance;
- To stimulate musical creation resulting from research on music technologies;
- To develop research in areas recently integrated in the university curriculum in Portugal: popular music studies, performance studies, dance, composition, and audiovisual archiving.

Research Groups:

- Ethnomusicology and Popular Music Studies
- Western Art Music from a Cultural Studies Perspective
- Ethnocoreology and Cultural Studies on Dance
- Creation, Theory and Music Technologies
- Performance Studies

Instituto de Filosofia da Linguagem (IFL / http://www.ifl.pt / EXCELLENT) The main purpose of IFL is to develop research programs in the current fields of philosophy of language, philosophy of logic, philosophy of communication, aesthetics, political philosophy, philosophy of mind, and areas of philosophy of action and moral philosophy which are the main research fields of the Institute. There is not in the IFL a unique and strict philosophical (not to mention, ideological) orientation such as analytical versus continental philosophy and one can speak in a plurality of orientations of its members.

Research Projects:

- Classics on Political Representation
- Concept and Example: Research on the Exemplary Character of the Work of Art Context and Communication
- Emotion, Cognition and Communication
- Extensional Semantics Assessed
- Film & Philosophy: Mapping an Encounter
- Form(s) of Life. A study from Wittgenstein's *Nachlass*
- Global Justice and International Terrorism
- Intentions and Conventions
- Paradoxes, Deductive, Inductive and decision-theoretic
- Philosophical Archipelago – National Program of Scientifical Reequipment
- Rationality and Communication - Learning to Talk About Ideas
- Scepticism, Modernity and Politics
- The impact of Rawls' Theory of justice on the conceptualization of European Union

Instituto de História da Arte (IHA / GOOD) is a Research Unit at the FCSH/UNL, with a research plan which includes areas from History of Ancient, Medieval and Contemporary Art, supported by a Pluriannual Funding Programme of I&D Units by FuCT. The evaluation process has created the conditions for the IHA to rebuild its organic structure. the main objectives of the IHA are (1) to develop and thoroughly study all areas of History of Art, Aesthetics, Theory and Methodology of History of Art, Museology and Heritage; (2) to carry out and support research projects pertaining to these areas; (3) to promote the creation of teams of specialized researchers within the context of post-graduate and post-doctorate degrees and their research guidelines; (4) to promote the dissemination of the results of the research through publications, the web site, general and monographic training courses, seminars, conferences and other scientific assemblies; (5) to increase scientific exchange between other institutions and between national and international researchers within their specific areas.

The IHA will base its future activity according to three new research lines, each of which led by a Responsible Investigator: Contemporary Art Studies, Architecture and Visual Arts and Museum Studies: Art Museums and Collections, and counts with 14 PhD researchers integrated in the Unit, and more 63 Team Members.

During the year of 2007, 15 Masters were completed, as well as 3 PhDs. Apart from the research lines covered by FuCT funds, the IHA has promoted several general and monographic courses. The IHA as also promoted several editions like the semestral edition of *Revista de História da Arte*, collection *Estudos*, collection *Temas e Perspectivas*, and collection *Teses*.

Instituto de História Contemporânea (**IHC / http://ihc.fcsh.unl.pt / EXCELLENT**) is devoted to study, education and dissemination in the field of Contemporary History in general and of Portuguese Contemporary History in particular. Its mission is:

- To develop and promote study and research of Contemporary History in general and of Portuguese History, at both national and international levels, maintaining a constant and

programmed activity, adequating and adjusting the principles and priorities of its scientific program to the training of researchers and the dissemination of the outcomes of their work;
- To contribute to the promotion of a culture based on history, indispensable for a sustained and generalized development of the knowledge society, through the accomplishment of actions and projects of scientific nature and an active dissemination of its outcomes making use of various communication platforms, from conventional publication to new information technologies;
- To intensify the degree and means of internationalization of studies and researches on contemporary history, stimulating interchanges, developing partnerships and networks and promoting interdisciplinarity at a national and international level.

Research Projects:
- Marconi in Lisbon
- History and Patrimony of the Portugal Telecom Group
- Organization of the Historical Documental Patrimony of the Fundação Portugal Telecom
- Portuguese Communities and Emigration: History and Memory
- Portuguese Tobis History
- History and Patrimony of National Federation of Child Care Institutions (FNIPI)
- History of the Engineers Association
- Portugal and Europe: from cooperation to integration. 60 years of History, 20 years of Joining
- A History of Europe and the Building of Europe. Portugal's Place.

Centro de Estudos de Geografia e Planeamento Regional (e-GEO / http://e-geo.fcsh.unl.pt/ GOOD). The main objectives of e-GEO are:
- To produce knowledge on concepts, methods, instruments and techniques in Geography and Spatial Planning and Development;
- To integrate senior undergraduate and graduate students in scientific activities;
- To promote the discussion and diffusion of research results;
- To offer extension services.

Research lines:
- Spatial Planning and Geographic Modelling:
  - *EURMET - Urban Sprawl of the Metropoles (SO/1.1/F4)*
  - *Geographical Minimal Elements for Environmental and Territorial Analysis*
  - *Lakes Classification in the Azores and Watercatchment Management*
  - GEOCOMP *Geocomputation in the Analysis of Socio-Spatial Phenomena*
  - RECONFAL - Reconfigurations in the Lisbon Metropolitan Area: Spaces, Actors and Strategies
  - AVUSOLO - *Evaluation of the Conditioning Factors of Land Use Management: Recent Dynamics in the Lisbon Metropolitan Area*

- Territory, Environment and Development:
  - SEARUSYN - *Seeking Synergy between Urban Growth, Horticulture and the Environment in Asian Metropolises*
  - *Development of an Information System for the Environmental and Economic Management of the "Dehesa/Montado" Ecosystem in Estremadura (Spain) and Alentejo (Portugal)*
  - *EADS and Territorial Strategies of South-western Europe* (INTERREG III Programme, EU CSF III)
  - *South Atlantic Network: Public Policies and Territory*
  - Family Farming, Employment and Income in North-eastern Brazil, Central-South Portugal and on the Santiago Island, Cape Verde
  - Identification and Diffusion of Family Farming Livelihood Strategies in North-eastern Brazil, Central-South Portugal and on the Santiago Island, Cape Verde
  - *IDENTERRA - Territorial Identity in Local and Regional Development: The Oeste Region of Portugal* (FCT/POCTI/GEO/48266/2002)
  - SUSTENREGIO - *Development Sustainability of Portuguese Regions*
  - GABI - Guide of Organic Farming Units: a Development Strategy for Portuguese Rural Areas
  - *Vale Formoso Erosion Experimental Research Centre*

CESNOVA (Centro de Estudos de Sociologia da UNL, http://cesnova.fcsh.unl.pt/) merged five former research centres: Gabinete de Investigação em Sociologia Aplicada **(SOCINOVA / GOOD)**, Investigações Sociológicas **(CEOS / GOOD)**, both funded by FuCT, Instituto de Sociologia Histórica, Forum Sociológico

and Faces de Eva, with the goal of joining efforts and connecting strategies for the development of basic and applied sociological and interdisciplinary research on Portuguese society.

Research groups:
- Portuguese Modernity – Compared Historical Sociology
- Public Policies and Social Responsibility
- Social Worlds, Trajectories and Mobilities
- Dynamics, Identities and Social Action

Centro de Estudos de Migrações e Minorias Étnicas (CEMME / http://ceas.iscte.pt/cria/ VERY GOOD) was recently merged with research units belonging to other Portuguese universities to form CRIA, an inter-institutional centre for social and cultural anthropology. This national platform in anthropology provides scientific research leadership and is organized to optimize intellectual and material resources, while promoting new research opportunities at both national and international levels. CRIA assembles researchers from various institutions, many of whom have had a pre-existing relationship in cooperation on the given thematic networks, projects and activities. CRIA's scientific resources will focus on research groups linked to four thematic lines, each one headed by a senior scholar.

Centro de Linguística da Universidade Nova de Lisboa (CLUNL / http://www.clunl.edu.pt / EXCELLENT) is a research unit that has as its main objectives the advancement of research in Theoretical and Applied Linguistics, the development of advanced training of researchers and the promotion of the publication of scientific data in those domains concerned with the nature and functioning of human language and in the areas of description and functioning of individual languages.
Research Groups:
- Comparative Linguistics
- Lexicology, Lexicography and Terminology
- Grammar and Text
- Discourse Interaction
- Psycholinguistics and Clinical Linguistics

5.2.2.3 FACULDADE DE ECONOMIA

INOVA (**http://inova.fe.unl.pt / EXCELLENT**) is the research unit of the School of Economics. Most of INOVA's researchers are simultaneously faculty members of the School, but INOVA's affiliated researchers also include holders of post-doc grants and members of institutions involved in joint projects. The research interests cover, among other fields, accounting, econometrics, economic history, finance, human resource management, macroeconomics, marketing, microeconomics, operations research and strategy.
INOVA's aim is to offer its members means to produce research publishable in top-ranked international journals in the aforementioned areas. By financing short visits of foreign scholars, summer schools, travelling to congresses and similar scientific meetings for presentation of on-going work, a weekly-meeting seminar series, a brown-bag seminar series, bibliography acquisitions, journals and database subscriptions and other researchers' needs, INOVA has been instrumental in enhancing the Department's research output. To its success attest the top grade (excellent) repeatedly awarded to INOVA by international external scientific panels of evaluation.
INOVA seeks to produce research publishable in top-quality outlets. The unit would like to strengthen its output in the very top journals, at the moment still limited, and to increase its research output in management. Moreover, the unit—and the department of which it is an integral part—are currently putting effort into attracting top researchers to strengthen its research output.

5.2.2.4 FACULDADE DE CIÊNCIAS MÉDICAS (FCM)

FCM is the host institution of two research centres supported by the FuCT: **Centro de Investigação em Genética Molecular Humana** (**CIGMH / http://cigmh.unl.pt/ VERY GOOD**) and **Centro de Estudos de Patologia Respiratória** (**CEPR**, classified as **VERY GOOD** in the 2002 evaluation) gave rise to a new centre which has recently undergone its first evaluation by FuCT (**Centro de Estudos de Doenças Crónicas, CEDOC / http://www.fcm.unl.pt/main/allDoc/dbcm/cedoc.pdf**). FCM has recently created a Research Office to promote research strategies as defined by the Scientific Council, to stimulate interdepartmental collaboration and interaction within FCM, to identify needs for human resources, facilities and equipment, and together with other national and international institutions, create the structure to provide administrative

support for future project applications, financial reports and to identify potential sources for funding of future research projects.

- CEDOC includes research groups with expertise from biomedical to clinical science, who have been working together for several years, aiming at the application of basic research data in clinical practice and medical education, whilst contributing to the formation of local, national and international partnerships. The 5 main objectives are: 1. development of multidisciplinary approaches to chronic diseases: from bench to bedside and services; 2. development of integrated networks with strategic national and international partnerships; 3. contributing to the development of new technologies; 4. attract medical students and young researchers and develop their scientific skills; 5. attract significant national and international funding. The unit is organized in 3 groups: Biomedical and Translational Research, Clinical Research and Epidemiology, Health Policy and Services. Currently, there are 30 PhDs working in CEDOC, of which 23 are from FCM.
- CIGMH aims to be an internationally leading centre in teaching and advancing innovative human genetic research, combining multidisciplinary approaches, developing knowledge and expertise, crucial for understanding the molecular basis of disease and treatment responses. This centre focuses, in particular, on integrating knowledge concerning gene organisation and expression regulation, signal transduction, individual genetic predisposition and the role of environmental chemical/physical factors, with the ultimate goal of implementing patient specific prevention strategies and treatments. CIGMH is supported by the pluriannual Financing Programme for R&D Units of FuCT. CIGMH brings together three teams which carry out complementary activities in the area of human molecular pathology: 1. Laboratory of Molecular Genetics of Life Sciences Department - FCT; 2. Department of Genetics – FCM and 3. Centre of Human Genetics - National Institute of Health, Dr. Ricardo Jorge. This centre includes 35 PhDs, of which 5 professors and 2 senior researchers belong to FCM working in the following areas: Monogenic diseases; Multifactorial diseases and genetic susceptibilities; Oncogenesis mechanisms and Oncobiology; Cytogenetic and Molecular Cytogenetic.

5.2.2.5 FACULDADE DE DIREITO (FD)

Centro de Estudos do Direito em Sociedade (**CEDIS / www.fd.unl.pt / VERY GOOD**) of the Faculdade de Direito da Universidade Nova de Lisboa:

- Was expressly labelled as a Centre for the study of *law in society*;
- Was organized according to an array of *strategic goals* to be carried out by *research projects*;
- Promotes *collective, interdisciplinary and internationally linked research*, *leaving however enough space for individual initiatives*, corresponding to the classical style of legal research, and prizing them as a valuable element of scientific personal realization;
- Aims to *connect research activities and educational goals*, fundamental in a *school*;
- Takes into account the fact that it serves a new and small academic community, assuming the goal of *bettering its general working conditions of scientific and academic work*.

5.2.2.6 INSTITUTO SUPERIOR DE ESTATÍSTICA E GESTÃO DE INFORMAÇÃO (ISEGI)

Centro de Estatística e Gestão de Informação (**CEGI / www.isegi.unl.pt / GOOD**) is an interdisciplinary research centre created in 1994. Its mission is to promote internationally recognized excellence in multidisciplinary and applied research in the scientific domains of statistics, economics and management, education science and policies, environmental science and technologies, and geography. CEGI develops R&D projects establishing strong relationships with companies and other universities. It also organises international and national conferences and seminars. Many of the projects are developed in collaboration with public and private entities of diverse areas such as finance, utilities, insurance, transportation, environment, pharmaceutical, energy and telecommunications industries. International contacts include the interchange of researchers, participation in research and teaching networks and the organization and participation in EU funding projects. CEGI's research team is composed of 12 PhD members with different but complementary backgrounds which enables the centre to have an interdisciplinary approach to a constantly evolving information society in accordance to CEGI's mission. This multidisciplinary nature is well evident in the type of publications and projects (both for R&D and applied research) achieved. CEGI's management is mainly conducted by a Scientific Coordinator (that is simultaneously the Chairman of the Scientific Committee of ISEGI) and a R&D manager who is responsible by operational management. ISEGI (host institution) provides the necessary physical facilities and services to the prosecution of CEGI activities.

5.2.2.7 INSTITUTO DE TECNOLOGIA QUÍMICA E BIOLÓGICA (ITQB / www.itqb.unl.pt / EXCELLENT)

Its mission is to develop scientifically recognized research in chemistry and the life sciences, considering all levels of complexity and its potential applications, to contribute to the understating of life's mechanisms and ultimately benefit the whole society. Since its foundation, ITQB has grown considerably in size and nowadays hosts 64 independent research groups, forming a scientific staff of more than 300 researchers. Research is organized in five divisions: Chemistry, Biological Chemistry, Biology, Plant Sciences and Technology.

5.2.2.8 INSTITUTO DE HIGIENE E MEDICINA TROPICAL

The **Unidade de Parasitologia e Microbiologia Médica (UPMM / www.ihmt.unl.pt / FAIR**) was established in 1994, as a Unit of the Programme of Pluriannual funding of FuCT. Its main objective is to contribute to the improvement of human health and to the advancement of biomedicine and health sciences related to the Tropical Health. UPMM has two scientific areas: Medical Parasitology with two groups - Medical Entomology and Medical Helminthology (including Medical Malacology), and Medical Microbiology with two groups, Virology and Mycobacteriology. Research activities are carried out either individually or with interactions among its groups and UPMM's collaborators and include malaria, schistosomiasis, leishmaniasis, onchocerciasis, arboviruses, tuberculosis, intestinal parasites, AIDS, fascioliasis, hidatid diseases, cysticercosis and other neglected and emerging diseases, with special focus on ecology, environment and population biology (parasites, vectors, intermediate hosts), host-pathogen interactions, immunodiagnosis, epidemiology, drug resistance and systematic. UPMM collaborates in post-graduate, master courses and doctoral programs of the IHMT.
Centro de Malária e outras Doenças Tropicais (CMDT-LA / www.cmdtla.org / EXCELLENT), was established in 1992 as Research Centre of the Institute of Hygiene and Tropical Medicine, under the auspices of the FuCT. Since December 2004, it was awarded the status of Associate Laboratory.

5.2.2.9 ESCOLA NACIONAL DE SAÚDE PÚBLICA

Centro de Investigação e Estudos em Saúde Pública (**CIESP / www.ensp.unl.pt/ciesp**) was created in 2007. It is a structure depending directly from the Scientific Council, with an interdisciplinary nature, that aims to promote, coordinate, support, and disseminate the ENSP research activities on Public Health. It promotes the interdisciplinary relationships' approach, in several public health areas, based on high quality research projects. CIESP includes 19 PhD members and 6 PhD students and it is now defining how to evolve to be an effective and competitive center on Public Health Research (new relationships with others national and international research centers). Therefore, its main goal is to promote and develop research in different disciplinary areas of the ENSP curricula, as well as in other areas identified as relevant to Public Health Development. CIESP strategic lines are particularly focused on governance systems change and promotion of knowledge in society, impact assessment and innovation. Some research areas include health services administration, health promotion, health management and policy and environmental and occupational health.

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Annex 5.3
Staff, PhD degrees awarded and post-graduate students

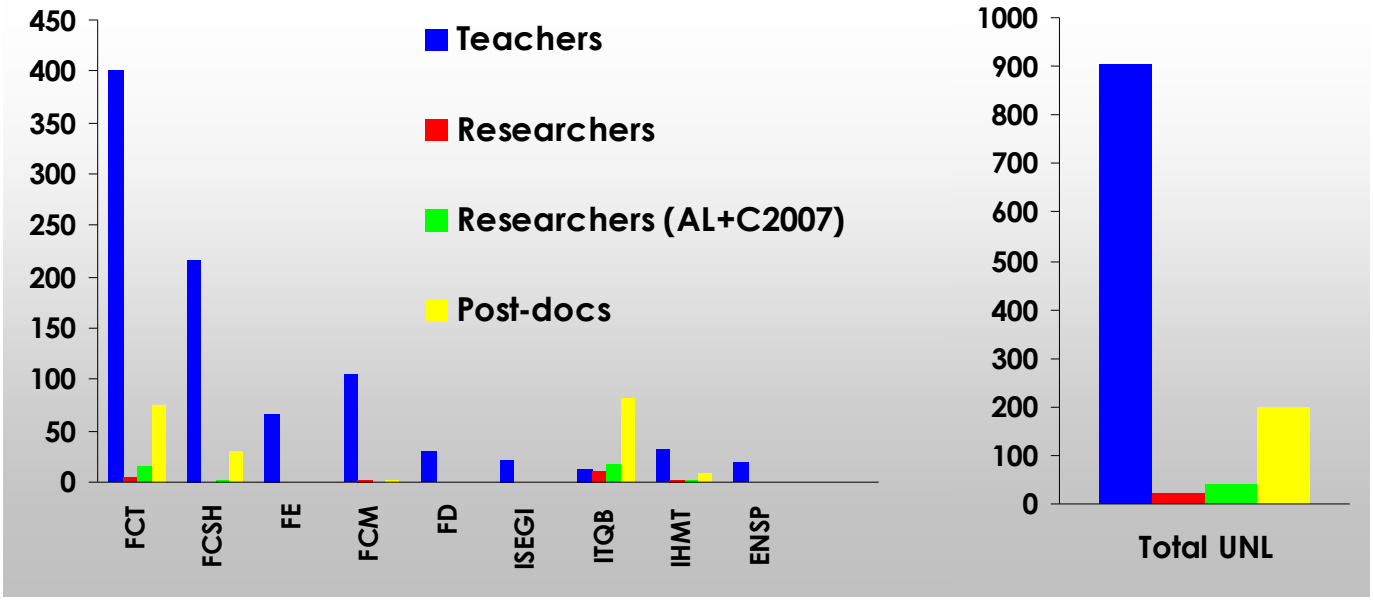
ANNEX 5.3 STAFF, PhD DEGREES AWARDED AND POST-GRADUATE STUDENTS

5.3.1. STAFF (PhD HOLDERS) AND POST-DOCTORAL STUDENTS (DECEMBER 2007)

Table 3.1

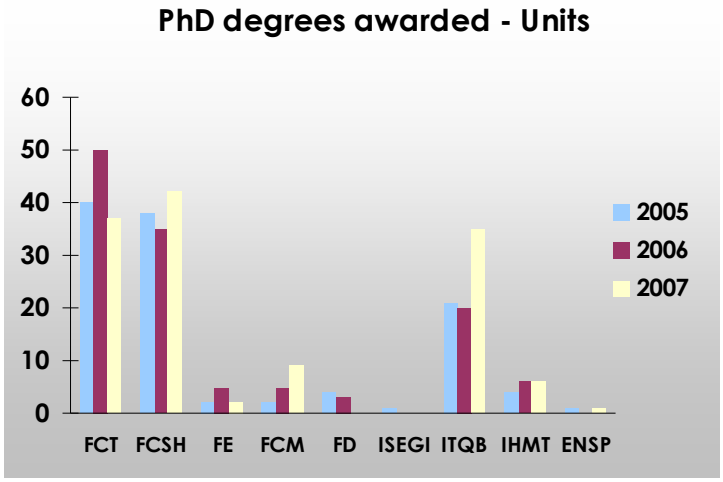
UNIT	Teachers	Researchers	Researchers (AL+C2007)	Post-docs
FCT	400	4	15	76
FCSH	217	1	3	31
FE	67	1	0	0
FCM	105	3	0	3
FD	30	0	0	1
ISEGI	22	0	0	0
ITQB	12	10	18	82
IHMT	32	3	3	8
ENSP	20	0	0	0
Total UNL	**905**	**22**	**39**	**201**

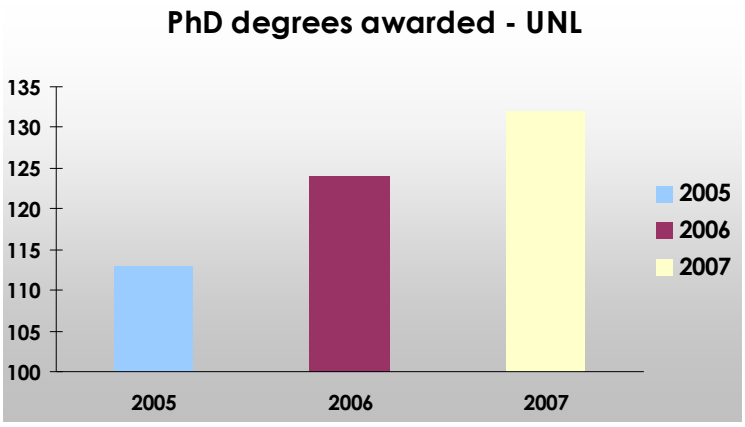
AL – Researchers contracted by the Associate Laboratories
C2007- Researchers contracted under *Programa Ciência 2007* (69 were recruited, although only 3 started their contracts until December 2007)



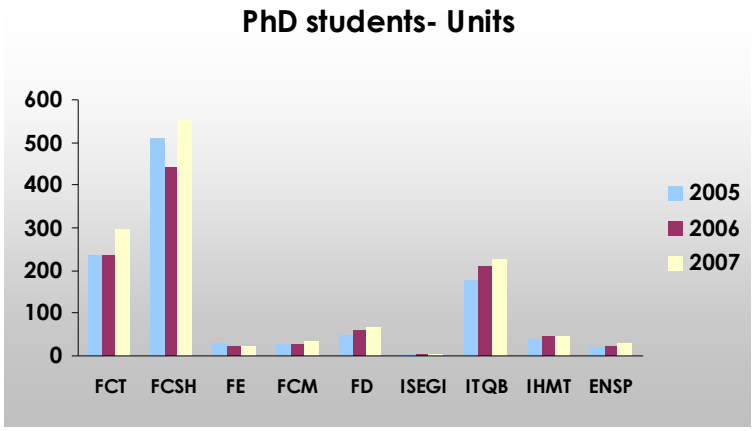
The average percentage of time dedicated to research by the teaching staff varies a lot among the units, and can be considered 30% in the units where first cycle is taught (FCT, FCSH, FE, FCM, FD, and ISEGI).

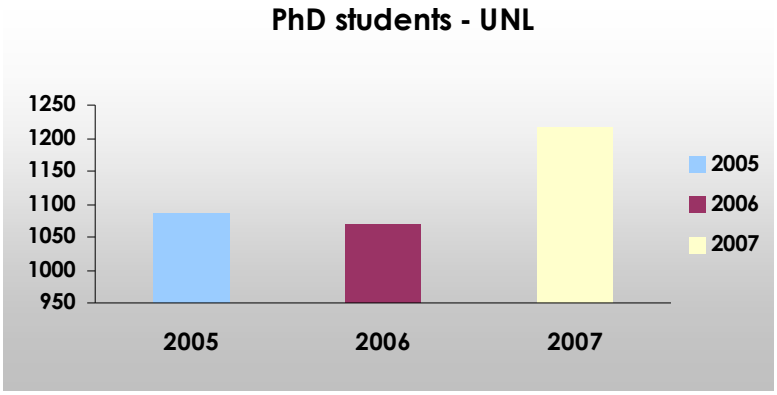
5.3.2 EVOLUTION OF PhD DEGREES AWARDED IN THE PERIOD 2005-2007



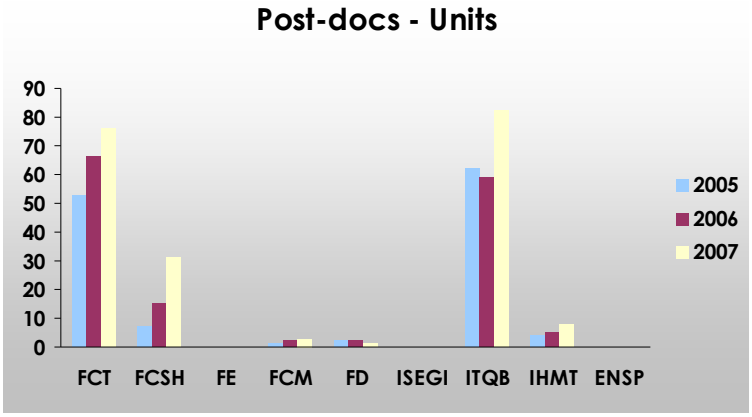


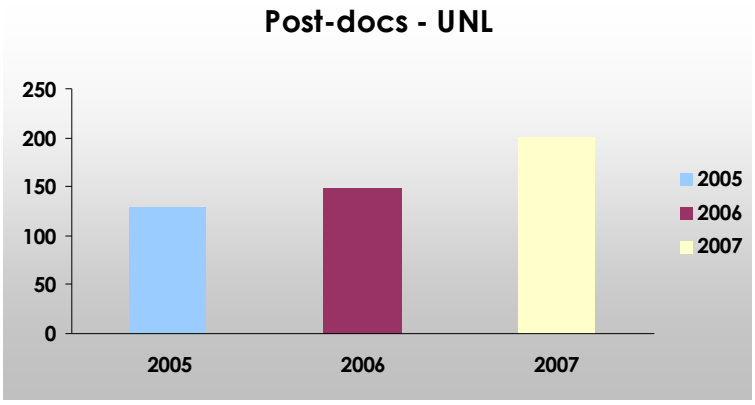
5.3.3 PhD STUDENTS





5.3.4 POST-DOCTORAL STUDENTS





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Annex 5.4
Brief description of research strategies of Academic Units

ANNEX 5.4. RESEARCH STRATEGIES OF UNL UNITS

5.4.1 FACULDADE DE CIÊNCIAS E TECNOLOGIA

Although a significant and growing fraction of the universities budget refers to own raised resources, the capacity of the universities to allocate financial resources to promote institutional research strategies is rather limited, due to budget constraints. In spite of these limitations, FCT has clearly defined as a strategic guideline the promotion and funding of interdisciplinary projects, integrating competences from different fields of knowledge in order to achieve critical mass, leverage resources and expand the potential of the research activities. Following this strategic guideline, the governing bodies decided to promote and co-fund interdisciplinary projects involving partnerships between the research centres. These projects were submitted to the *Programa Ciência 2007* and 7 research proposals involving 11 research centres were approved. In the frame of this programme, 37 new researchers (with at least 3 years of post-doctoral experience) were selected internationally and hired. Seventeen of these researchers are foreigners, revealing how open the selection process was and how attractive these projects were to the international scientific community. The co-funding of FCT represents 15% of the total programme budget for a period of 5 years. Within the same interdisciplinary approach, two new positions of Associate Professor centrally supported by the school were open; applications were evaluated with the assistance of an independent international board (the areas will promote the collaboration between different Departments of FCT and of the Department of Physics with FCM). The new statutes will be approved by the end of 2008 and the research strategy and priorities will be discussed and implemented by the new governing bodies.

5.4.2 FACULDADE DE CIÊNCIAS SOCIAIS E HUMANAS

FCSH is one of the most heterogeneous academic units in UNL, in both its disciplinary and thematic concerns. A large number of departments and research centres have therefore emerged over time, each setting its own research agenda. The strategy is to upgrade quality in research along axial guidelines, clustered around the top-ranking research centres as identified by external evaluations, to put in place an effective internal evaluation system, and to actively engage researchers and centres in national and international collaborative networks. The directive bodies have recently endeavored to organize the wide variety research agendas into four interdisciplinary axes on which to focus interdisciplinary research and advanced teaching: 1. Social dynamics and public policy, 2. Communication and language, 3. Portuguese language and literature studies, 4. Portuguese historical and cultural heritage; and they have identified the existing poles of excellent and very good research by external evaluation standards, and the clusters of research centres around each axis. A specialized administrative unit was recently created to provide information about national and international research opportunities and to provide support for applications, along with the existing support for project management.

5.4.3 FACULDADE DE ECONOMIA

The FE does not set research strategies or priorities for its researchers—this is neither adequate, nor current practice in Economics and Business research. Instead, researchers are evaluated based on the quality of the journals where their research is published and the impact of the publications on the profession. Since the researchers are also faculty members, they are subject to a “publish-or-perish” evaluation system throughout their careers. Hence, their publication records largely determine their ultimate success. This ensures that their incentives are aligned with the objectives of FE.

5.4.4 FACULDADE DE CIÊNCIAS MÉDICAS

The strategy of FCM is to focus most part of research in CEDOC and CIGMH, in order to develop research on chronic and genetic diseases, the main areas of theses centres. CEDOC began as a centre for the study of respiratory diseases, but the strategy of FCM broadened its areas of research to chronic diseases to increase critical mass, interdepartmental collaboration, and to take advantage of synergies.

5.4.5 FACULDADE DE DIREITO

The FD, through its centre CEDIS, aims to promote team-organized, planned, accountable and evaluated research in juridical sciences; to foster inter-institutional, inter-disciplinal and international research, and to include students in research teams and activities. This has been accomplished through applications to research project institutional calls and by creating a programme of research grants for students.

5.4.6 INSTITUTO SUPERIOR DE ESTATÍSTICA E GESTÃO DE INFORMAÇÃO

ISEGI promotes multidisciplinary and applied research in the scientific domains of statistics, economics and management, education science and policies, environmental science and technologies, and geographic information science. ISEGI provides research opportunities to national and international students. Furthermore, researchers are encouraged to increase their scientific production in ISEGI’s research domains, especially in accredited journals.

5.4.7 INSTITUTO DE TECNOLOGIA QUÍMICA E BIOLÓGICA

ITQB is a research and advanced training institute in chemistry, life sciences, and associated technologies. Some of the advanced higher education programs (Masters and PhDs) involve partnerships with other institutions, within and outside UNL, namely with IGC and IBET (AL). The strategic directions are being implemented at the institutional level, but also through the strategic partnerships, mostly through the AL. Since the majority of research grants are awarded to individual researchers, the most important instrument for institutional strategy planning is through the hiring of new researchers (mostly junior group leaders) and in attracting external groups. Additionally, the small remaining funds from budget execution, are used to acquire strategic equipment and provide seed money for group support. Some funds have been allocated to specific inter-institutional collaborations in order to foster certain types of research.

5.4.8 INSTITUTO DE HIGIENE E MEDICINA TROPICAL

At IHMT, there is not an institutional strategy *per se*, research is supported through individual initiatives of professors, researchers and post docs, mostly through direct search for national and international funding.

5.4.9 ESCOLA NACIONAL DE SAÚDE PÚBLICA

Research at ENSP and its centre, CIESP, is focused mainly on health services research; health promotion; health management and policy; environmental and occupational health. The creation of CIESP in 2007 is aligned with the institutional research strategy; its structure directly depends from the Scientific Council, and it aims at promoting, coordinating, supporting and disseminating the ENSP research activities. It strongly promotes interdisciplinary approaches across several public health areas, based on high-quality research projects.

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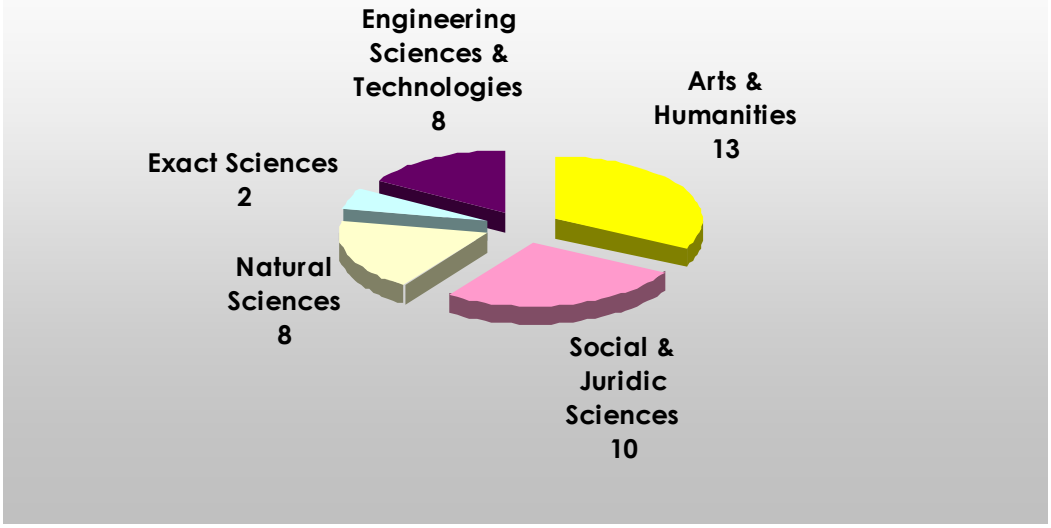
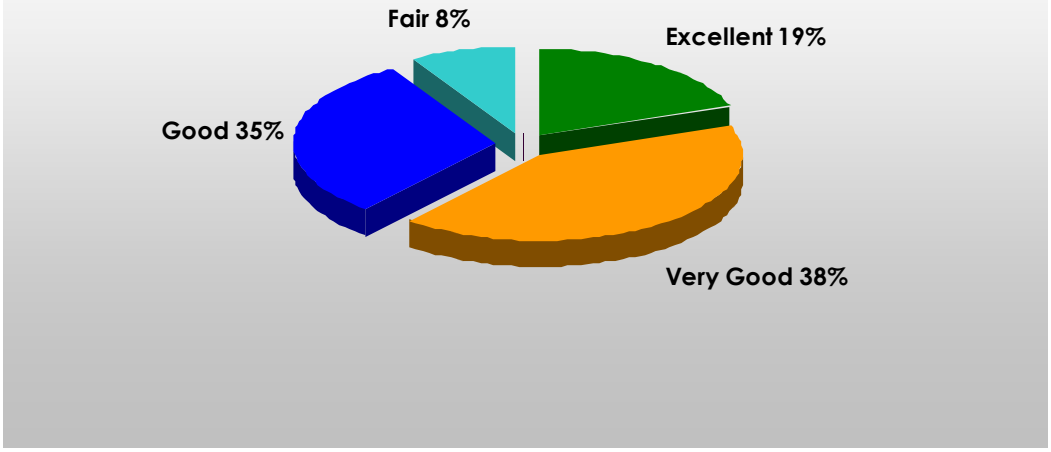
Annex 5.5
Classification of research units

ANNEX 5.5 CLASSIFICATION OF RESEARCH UNITS

Scientific Areas of UNL Research Centres



Classification of UNL Research Centres in 2002



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Annex 5.6
Results of the bibliometric study of UNL

ANNEX 5.6 RESULTS OF THE BIBLIOMETRIC STUDY OF UNL PUBLICATIONS INDEXED TO WEB OF SCIENCE (2000-2006)

5.6.1 UNL ANALYSIS

This study was carried out by the Centre for Science and Technology Studies (CWTS), Leiden University, the Netherlands.

Its main objectives were to assess the impact of the UNL publications in journals indexed to Web of Science (WoS), using internationally recognized methods that allow the calculation of a wide range of bibliometric indicators.

Solid conclusions can be withdrawn for the majority of the Natural and Exact Sciences, where the coverage of WoS is excellent. For the remaining branches of knowledge new tools and methodologies of measuring have to be found, as the universe of publications of the WoS doesn't clearly apply.

Within the scope/applicability of this study, areas of excellence, strengths, and weaknesses were identified and the bibliometric data obtained for UNL was compared with the data for other Portuguese and European Universities. The main results were as follows:

- Between 2000-2003 and 2003-2006 the number of UNL publications in journals indexed to *WoS* increased **37%** and the number of citations increased **54%** (Figure 1);

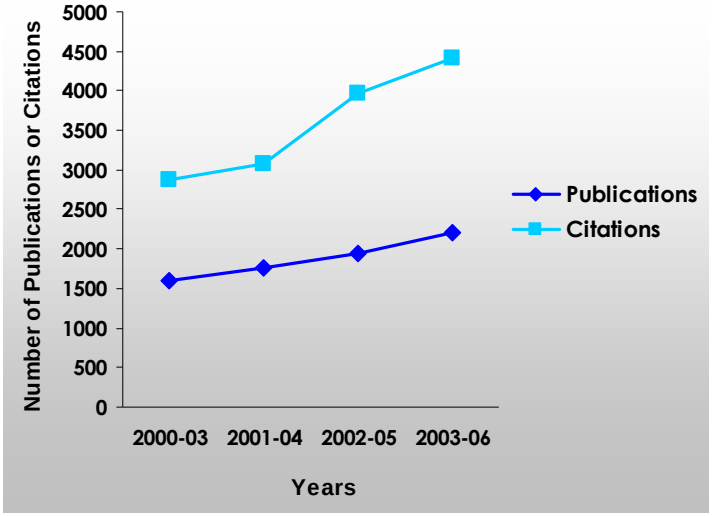

Figure 1

- The ***field-normalized citation impact,*** **CPP/FCSm,** increased from **0.72** (1997-2000) to **0.82** in 2000-2003 and to **0.87** in 2003-2006, 13% below international level (Figure 2);

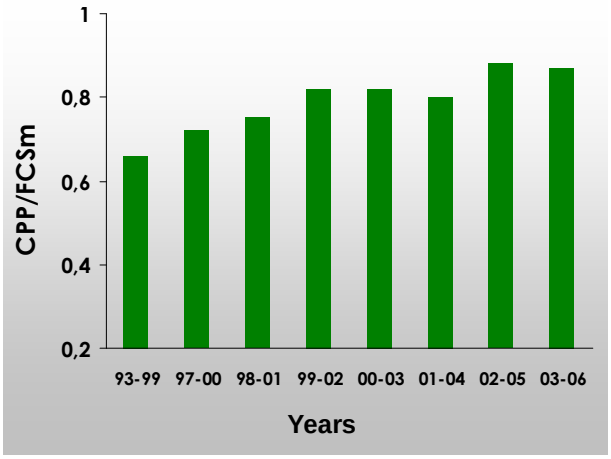

Figure 2

- The *field-normalized citation impact* CPP/FCSm compares the average number of citations excluding self-citations (CPP) obtained by the oeuvre of a research unit to the international reference value (FCSm, the mean field(s) citation score);

- The percentage of publications in the top-20%,10% and 5% increased **64**, **82** and **89%**, respectively, between 1997-2000 and 2000-2003; The number of publications in the top-1% tripled in the same period of time (Figure 3);

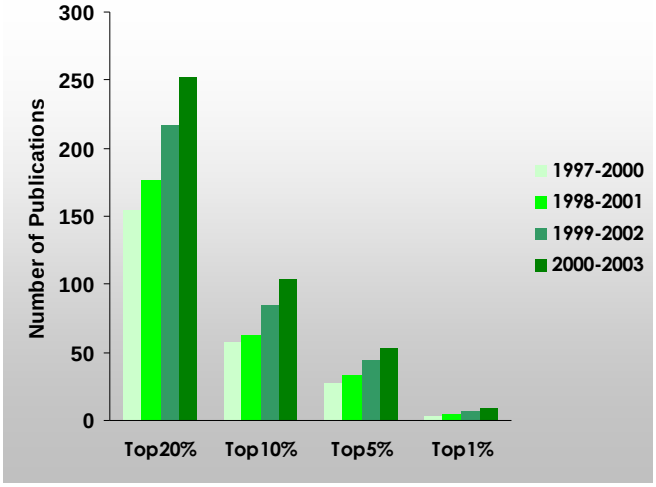

Figure 3

- The percentage of publications in international collaboration is 50% (CPP/FCSm **0.99**), 32% result from national collaborations (**0.72),** whereas only 18% of production correspond to "No collaboration" (**0.72**) (Figure 4);

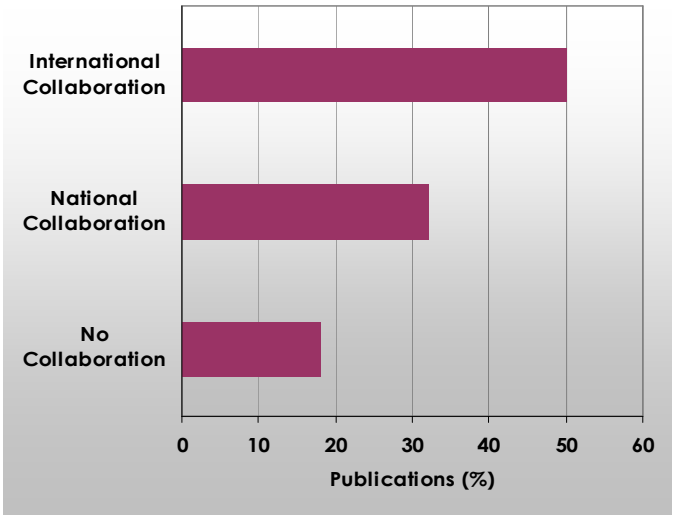

Figure 4

- The study analyzed the 30 scientific subfields (according to the WoS classification) in which UNL has the largest publication output, showing that:

  (i) The impact is significantly above international average (**CPP/FCSm > 1.2**) in Engineering - Chemical, Chemistry - Multidisciplinary, Pharmacology & Pharmacy, and Infectious Diseases (Figure 5).

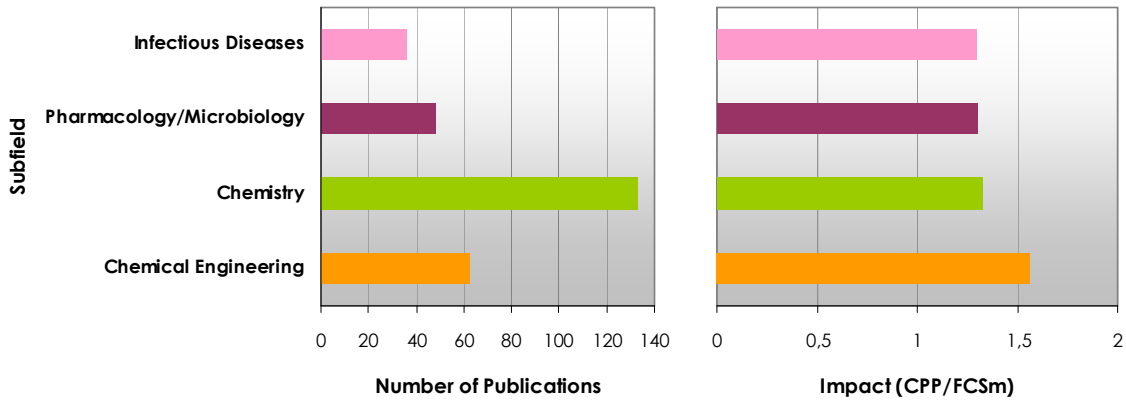

Figure 5

(ii) The impact is average (**0.8<CPP/FCSm<1.2**) in Plant Sciences, Food Science & Technology, Computer Science - Theory & Methods, Microbiology, Chemistry - Inorganic & Applied, Mathematics - Applied, Chemistry - Organic, Parasitology, Physical Chemistry, Materials Science – Ceramics, and Biophysics.

(iii) On the other hand, two of the subfields of highest output, Biochemistry & Molecular Biology and Materials Science - Multidisciplinary, have an impact significantly lower than the international average (**CPP/FCSm < 0.8**).

5.6.2 BENCHMARKING WITH OTHER PORTUGUESE AND EUROPEAN UNIVERSITIES

- The normalized impact of UNL (CPP/FCSm = **0.87**) is similar to that of the other Portuguese universities selected, 24% below the impact of the 34 benchmarks chosen (**1.15**) and 15% below Europe (**1.03**).

- Despite the fact that the impact of the benchmarking universities is generally high, UNL has a similar impact in 3 areas: Biological Sciences – Humans, Biological Sciences – Animals & Plants and Mathematics.

- When compared to the main Portuguese Universities, UNL has higher impact (difference in CPP/FCSm >0.15) in 3 areas: Biological Sciences – Humans (**0.93**), Chemistry (**0.99**), and Multidisciplinary Sciences (**1.01**).

- Analysis of the recent performance of UNL (publications 2003-2006) showed that among 364 world universities, UNL is in the Top100 in Biological Sciences – Animals & Plants, in the Top150 in Mathematics and in the Top270 in Geosciences, Engineering, Economics and Multidisciplinary Sciences.

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Annex 5.7
Parameters and indicators for quality assessment - research

ANNEX 5.7 PARAMETERS AND INDICATORS FOR QUALITY ASSESSMENT - RESEARCH

5.7.1 POST-GRADUATE POPULATION

- PhD degrees awarded
- PhD degrees/FTE PhD
- Number of PhD students and post-docs
- Percentage of international post-graduate population

5.7.2 COMPETITIVENESS

- Percentage of success in calls for national projects
- Research income
- Economic valorisation (patents, spin-offs)

5.7.3 PUBLICATIONS

- Publications
- Web of Science Publications
- Field-normalized impact of Web of Science Publications (where appropriate)

5.7.4 ESTEEM

- National and international awards for research
- Organization of international events

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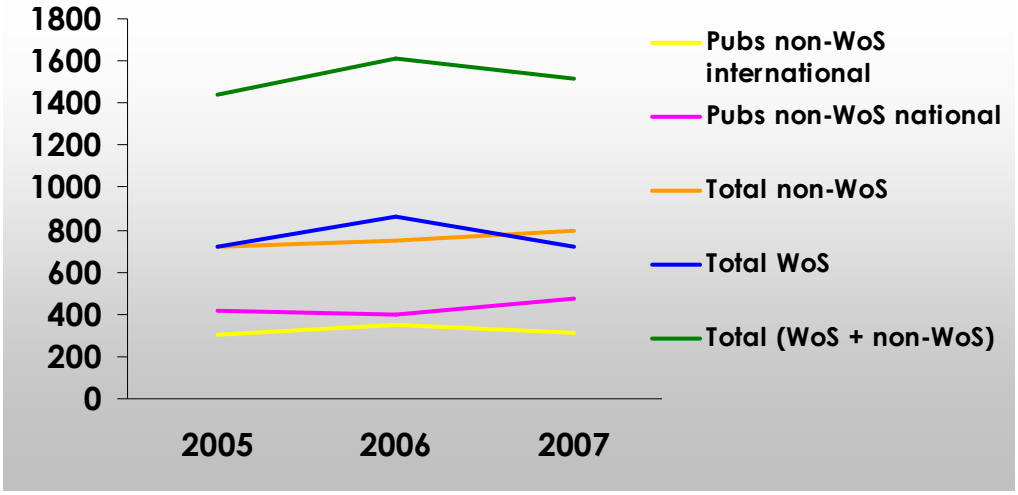
Annex 5.8
Publications

ANNEX 5.8 PUBLICATIONS

5.8.1 PUBLICATIONS (2005-2007)



Pubs WoS: articles, reviews, notes, letters and conference proceedings in periodicals indexed in the Web of Science
Pubs non-WoS: books, book chapters, and articles in journals not indexed in the Web of Science. IMPORTANT NOTE: Conference proceedings not indexed are not included in this analysis.

UNIVERSIDADE NOVA DE LISBOA

Self-Evaluation Report

January 2009

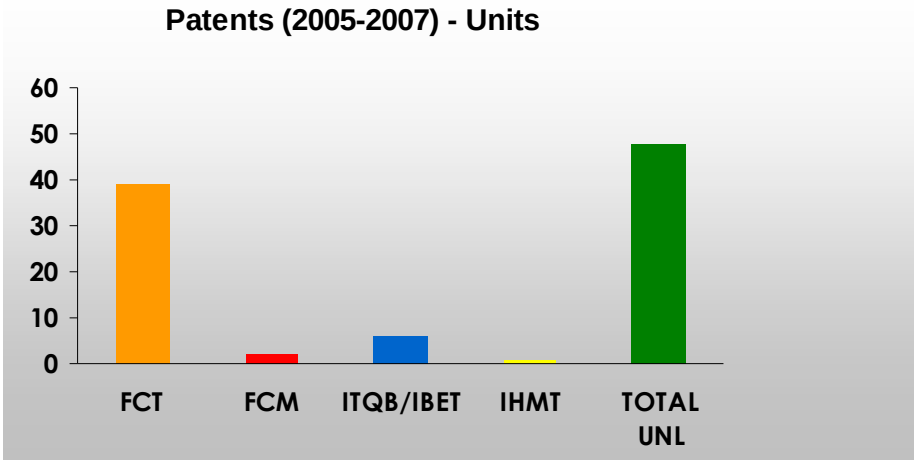
Annex 5.9
Patents and spin-offs

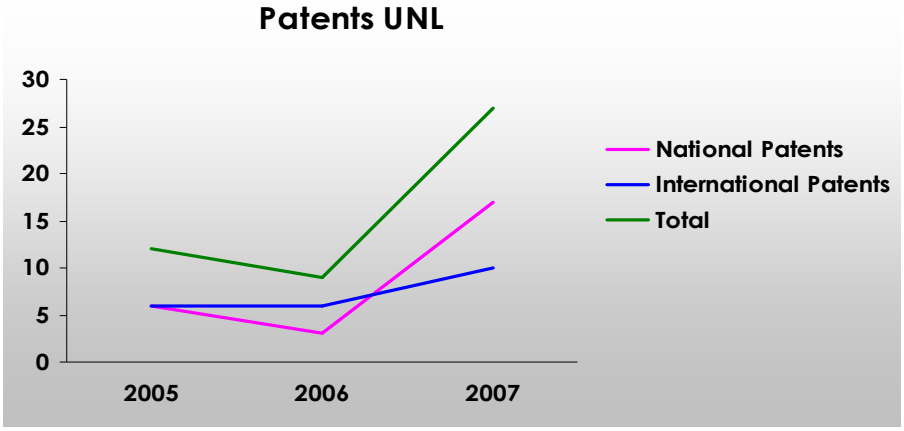
ANNEX 5.9 PATENTS AND SPIN-OFFS

5.9.1 START-UPS, SPIN-OFFS AND R&D CENTRES AT MADAN PARQUE

Year	Start-ups & spin-offs	R&D Centres	Total
1995-2004	38	0	38
2005	1	0	1
2006	7	0	7
2007	3	2	5
Total	49	2	51

5.9.2 PATENTS (2005-2007)





5.9.3. SPIN-OFFS (Name / website/ year of formation / Nr of collaborators)

5.9.3.1. FACULDADE DE CIÊNCIAS E TECNOLOGIA

YDreams / www.ydreams.com / 2000 / Collaborators: 180

E.Value / www.evalue.pt 2004 / Collaborators: 14

Prova Essencial / 2007 / Collaborators: 3

Acácia Acacia Semiconductor S.A. / www.acaciasemi.com / 2003 / Collaborators: 12

NGNS - Ingenious Solutions Lda. / www.ngns-is.com / 2006 / Collaborators: 9

NMT - Tecnologia, Inovação e Consultoria Lda. / 2007 / Collaborators: 7

SOLCHEMAR / www.solchemar.com / 2004 / Collaborators: 5

5.9.3.2. INSTITUTO DE TECNOLOGIA QUÍMICA E BIOLÓGICA

Genibet www.genibet.eu / 2006 / Collaborators: 3

Theraproteins www.theraproteins.com / 2005 /Collaborators: 4

ECBIO www.ecbio.com / 2003 / Collaborators: 7

Alfama www.alfama.com.pt /2003 / Collaborators: 10

CEV / 2007 / Collaborators: 6

Stab www.stabvida.com / 2000 / Collaborators: 6