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Institutional Internationalization Project  
Universidade Federal do Rio Grande do Sul

Executive Summary

The Institutional Internationalization Project of Universidade Federal do Rio Grande do Sul (IIP / UFRGS) is an outbound and inbound research and mobility program aiming at excellence, involving 65 Graduate Programs (CAPES grades 4, 5, 6 and 7) and proposing 96 interaction projects distributed in eight major research themes, aiming to consolidate the internationalization actions of the University.

Alignment with UFRGS’s Institutional Plans

The IIP/UFRGS is in line with the University’s Institutional Plan for Internationalization, and with its Institutional Development Plan. These affirm the principles of comprehensive internationalization at UFRGS, covering Teaching (including undergraduate, graduate and distance learning), Research (which must be reinforced, recognized and amplified by internationalization) and Extension or Outreach activities. Besides these, Innovation is also explicitly one of the focuses of UFRGS to be considered in its internationalization policy. UFRGS has three main objectives in its internationalization plan: improving its research with partners from countries with high impact factors; being a regional leader in Latin-America; and developing new, original relationships with large emerging countries (BRICS).

The overall objective of the IIP/UFRGS is the qualification and international insertion of postgraduate activities and research at UFRGS, through the expansion of symmetrical partnerships with highly qualified institutions, starting from the 364 well-ranked foreign universities with which UFRGS has effective interactions. Thus, UFRGS will enhance its current institutional objectives in research and its activities at postgraduate level, and improve the competencies and knowledge areas in which we already have strong background.

This project intends to increase the mobility of all segments, the multilingual nature of the University's actions, to develop a policy for attraction and institutional integration of visiting professors, to offer visiting researchers and postdoctoral fellowships, and to improve the hosting of academic research partners.

Finally, we will expand the agreements of double and joint degrees, at PhD level (Cotutelle) and at undergraduate level (as a means to prepare better postgraduate students).

Thus, the principles of the Institutional Internationalization Plan of UFRGS coincide with the IIP/UFRGS when considering that, firstly, internationalization of UFRGS does not only mean expanding outgoing mobility, but also increasing multicultural experiences within the University. Second, the internationalization process gets along with other structuring transformations of the modern Brazilian university, such as the opening of the academic world to plurality. It should be noted that these processes are not in mutual opposition; on the contrary, they are strictly complementary.

Diagnosis: strong, international research at UFRGS

The IIP/UFRGS has been elaborated based on an internal diagnosis of the pre-existing partnerships through the aggregated knowledge of (a) the Post-Graduate and Research Pro-Rectors offices, in order to obtain the track record of international grants; (b) the Office of International Affairs, which has knowledge of international agreements and effective activities supported by them; (c) a comprehensive questionnaire sent to all potentially eligible PRINT/CAPES Programs. In the questionnaire, each Post-Graduate Program
(PPG) has indicated to which of the eight major crosscutting themes it could contribute, and has listed its foreign partners as well as the international actions it has developed with these partners.

From this data, the IIP/UFRGS has defined a weighted list of strategic partners ordered by an indicator that considers three criteria: (1) the excellence of the PPGs that originated the partnerships (basically measured by the grade awarded by CAPES to the Program); (2) the excellence of the foreign Partner (measured by the international rankings ARWU, QS and THE); (3) the quality of the scientific relationship between the PPG and the Partner, measured by the existence of missions (outbound/incoming visiting researchers), sending/receiving doctoral students, and co-organization of scientific events.

It is worth detailing that this indicator makes it possible to prioritize not only the absolute quality, at UFRGS or abroad, of the researchers involved, but also to consider the history of the partnership. Moreover, this indicator makes it possible to prioritize partners and activities - for each research theme - and above all, to allocate the available grant proportionally to this indicator.

The result of this analysis led to the definition of partnership consolidation strategies and showed the concentration of partnerships within the countries prioritized by CAPES: Specifically, through the defined indicator, 364 universities and research institutes from 38 different countries were identified. 89.3% of these institutions are in the list of countries prioritized by CAPES. The main exceptions are Australia, Portugal, Chile, and Colombia. Therefore, the leading research at UFRGS at an international level focuses on the countries contemplated and prioritized by PRINT/CAPES at a level much higher than the required percentage of 70% from the PRINT/CAPES call for proposals.

Our indicator of partnership also enables to classify them into three groups: the very strong partners, with a history of mutual development, having state-of-the-art research with at least four different programs at UFRGS; the strong partners, with a history and mutual support, but concentrated in one or two UFRGS research groups; and quality partners, presenting a recent history or interaction with smaller groups.

This grouping matches with the countries of the partner institutions, based on their scientific experience and their history of partnership with Brazil. Group 1 is concentrated on the United States, France, Germany, Canada, Italy, United Kingdom and Spain. In the case of these historical partner countries, UFRGS has solid evidence of previous results and contributions, such as co-authored research articles, long term joint research projects, exchanges of doctoral students in both directions (mobility in/out), the joint organization of scientific events and, very importantly, joint fund-raising through specific programs (e.g. CAPES/COFECUB, CAPES/PROBRAL, CAPES/Newton Fund, Horizon2020, Erasmus + Jean Monnet), multilateral or bilateral. In this group, UFRGS is also in contact with higher education institutions of countries that have defined programs or networks of excellence (Germany, France, Canada, Australia) or have a tradition of partnership with the private sector to foster research; and with institutions of higher education that are looking for our University to associate perennially on the different research themes.

The second group of institutions (“Strong partners”) comes from the same countries, or countries from similar regions, but which are smaller or have a more recent history with Brazil: Australia, francophone Canada, Sweden or Norway are in such a group.

The third group includes the major emerging countries, BRICS and Latin America.

Scientific Priorities

In order to achieve the objectives of UFRGS’s Internationalization Plan, the IIP/UFRGS proposes to consolidate the internationalization actions of the University in eight major research themes that attend the self-declared research and education vocation of the participating Programs (all of them with highly qualified international activities, and main contributors for the scientific results obtained by UFRGS in the last years). The proposed actions also consider the current research projects, the scientific production, the
commitment to the generation of knowledge, and the formation of high level human resources. The actions consider the international partnerships already consolidated or under consolidation with international universities and research institutes which have shown effective cooperation with UFRGS.

These eight themes are aligned with national postgraduate and research priorities and articulate with the major innovative themes and challenges of international research. The eight themes are:

Theme 1. Sustainable development; diversities; climate change; international cooperation; environmental, social and economic sustainability, including historical, political, cultural, ethical and legal aspects: to research sustainable development integrating different perspectives, inserting the university in the research and discussion forums on climate change, and establishing a network of research for studies related to sustainable development;

Theme 2. Integration between basic Science, Information Technology, Engineering, Arts and Mathematics [STEAM]: to expand projects involving STEAM integration (Science, Technology, Engineering, Arts, and Mathematics) and create research lines focused on STEAM integration;

Theme 3. Impact, development, access to and insertion of new technologies, artificial intelligence, information technology and robotics in the future of work: studying new technologies, establishing a network for research into the future of work and the impact of new technologies; encourage new graduate programs or areas of concentration aligned with new technologies and professions;

Theme 4. Large-scale health sciences, translational medicine and its socio-economic impact: deepen research oriented by translational medicine, studying national and international health promotion programs and evaluating their economic impact;

Theme 5. Energy of the future, new fuels, non-polluting and/or recyclable energy/fuels: study of non-polluting and/or recyclable energy sources and establishment of a network to study the use of new fuels, as well as new technologies for energy conversion and storage;

Theme 6. Intelligent cities, complex urbanizations, industry 4.0 and sharing economy: studying cities considering international good practices, including the insertion of industry 4.0 in the Brazilian scope and the development of research networks in circular economy applications;

Theme 7. Food chain and agriculture, food security: researching agriculture, supply chains and food security from the perspective of introducing new technologies and alternatives in agriculture, as well as studying food chains of interest to the country and establishing a network for food security studies;

Theme 8. Education of high-level human resources for action in strategic areas: education of high-level human resources through the continuous qualification of graduate programs, with an increase of the international experience of graduate students and of the scope of this experience.

Considering these eight themes, the IIP/UFRGS encompasses 96 projects of interaction and mobility, deepening what is stated in the University’s Institutional Plan for Internationalization in order to expand the historical relations with the countries of Europe, North America and Asia, which have strong scientific impact. The objective, along with these partners is the excellence of research, with symmetry of procedures and joint funding of common actions.

One of the general objectives of IIP/UFRGS is to achieve more visibility among international partners, including broadening partnerships and attracting foreign talents. Thus, working as peers with universities of recognized excellence is a fundamental part of the general objective of the University's Institutional Project of Internationalization.
Specific Policies

The UFRGS Institutional Plan for Internationalization states that by broadening the options to expose our researchers and our students to a greater number of (academic) cultures, whether by bringing them into UFRGS, or by sending members of our community abroad, we provide a richer experience to all parts involved. This enrichment enables us to renew ideas, to improve the experience of our students, to prepare our community to live in a more integrated world than in the past, and to produce higher quality scientific knowledge.

The IIIP/UFRGS realizes what the Institutional Plan for Internationalization proposes: the expansion of the offer of undergraduate and graduate courses in foreign languages, an increase of joint international research projects, the promotion and hosting of foreign scientific visits, the promotion of publications in different languages, and fostering the participation of UFRGS in accreditation processes. It is also an internationalization goal to increase joint undergraduate and graduate degrees with foreign institutions.

Every academic semester, UFRGS receives about 700 foreign students (1/3 at the undergraduate level, 2/3 at the graduate level). At graduate level, important historical programs like PAEC and PEC-PG have increased this experience (in the PAEC program, UFRGS is the 5th Brazilian hosting university for foreign PhD students). In 2018, the main countries of origin of foreign students in UFRGS are Latin-American: Colombia, Argentina, and Peru. However, France, Germany and Spain are also countries that have sent students consistently to study at UFRGS, mostly due to our research agreements and to the quality of our research infrastructure and laboratories. The expansion of non-Latin American incoming mobility is due to the expansion of the offer of courses taught in English, a phenomenon that has already begun at UFRGS, but needs to be accelerated.

As for the attraction of teachers and researchers, rather than concentrating on the federal public tender or hiring legislation, on which the institution has little control, the IIIP/UFRGS focuses the attraction strategy on the offer of scholarships to bring in recent doctoral graduates and PhD students to UFRGS from foreign countries, who can thus get involved in our research groups, see some interest in permanent positions at UFRGS, and prepare for a public tender at our university. Experience shows that this attraction strategy has been a powerful tool to contract foreign talents, motivated by the wealth of the research at UFRGS.

Regarding Innovation, UFRGS’s internationalization policy includes two modalities: (1) it offers and promotes internships in companies or research laboratories abroad for UFRGS students, and in Porto Alegre for foreign students; the actions envisaged are complementary to the research activities, and / or also involve professors of the graduate programs contemplated by the IIIP/UFRGS; (2) it takes advantage of the various business incubators based at UFRGS, with a natural vocation to work at an international level and interested in hosting foreign students through internships, or to engage alumni from UFRGS who have had experience abroad.

Still on this line of research internships, an important source of international opportunities to be developed within the scope of the IIIP/UFRGS is the “Scientific Initiation” scholarships. This important means to "teach research", uncommon in foreign countries, enables young foreign students to be admitted to internships in laboratories and research groups at UFRGS and, through them, have advisors from our university in contact with foreign partner institutions. Conversely, a Brazilian student with experience acquired during scientific initiation has the potential not only to go abroad to participate in classroom activities, but also to engage with researchers, contributing to approach national and foreign research groups.

Internal Management of the Grant

UFRGS’s Institutional Internationalization Project identifies strengths and weaknesses in our institution and its surroundings. Among the strengths we emphasize: the rich portfolio of international agreements signed; the consistent research history of recognized international excellence; and the competence for
internationalization management, institutionalized for more than 20 years at UFRGS. Among the weaknesses we have: a national legislation not really open to foreigners; the complex internal organization of the university; and, at the city and university levels, the increasing infrastructural limitations that threaten the attractive power of UFRGS and the quality of its research.

The II/P/UFRGS, following the schedule established by the PRINT/CAPES Public Call, will be developed over a period of four years between the second half of 2018 and the first semester of 2022. During this period, the proposed mobility grants have been distributed for each of the 96 projects, year by year, considering the different modalities described in the CAPES Call, and according to the weighing indicator that we have detailed above to reflect UFRGS’s international priorities.

The resources being requested refer to the mobility actions proposed by PRINT/CAPES, for a total amount of R$ 117,664,738.42 (one hundred and seventeen million, six hundred and sixty-four thousand, seven hundred and thirty-eight Reais) – roughly 33 Million US$, or 27 Million €.

The management committee of the II/P/UFRGS is composed of representatives of the major research areas and includes senior researchers, holders of CNPq productivity scholarships, all presenting strong international experience. The invited international consultant, Prof. Hans-Ulrich Heiß (Technische-Universität Berlin), has a strong knowledge of UFRGS, CAPES, and Brazil in general, having participated in joint research projects, developed Double Diploma and Co-Tutorship agreements with UFRGS, and being one of the leaders of TUB's international policy of excellence.

This Executive Summary - Institutional Internationalization Project of the Federal University of Rio Grande do Sul has the objectives, strategies and policies summarized here as a guide to conduct the University towards internationalization in the coming years, relying on the support of our academic community to reach new international levels.
Institutional Internationalization Plan at the Graduate and Research Level

The Universidade Federal do Rio Grande do Sul Institutional Internationalization Plan summarizes the topics on internationalization addressed on UFRGS's Institutional Development Plan (Plano de Desenvolvimento Institucional - PDI) for the years 2016-2026. This detailed analysis provides an opportunity to more clearly emphasize the main points and relevant strategies that identify the University as actively engaged in the strengthening of its internationalization at all levels.

UFRGS's Institutional Development Plan represents "the ensemble of the university community's wishes for UFRGS in the next ten years." Translator's note: these quotes were extracted from UFRGS's Institutional Development Plan, which can be consulted in Portuguese at http://www.ufrgs.br/pdi/PDI_2016a2026_UFRGS.pdf.

It was conceived to "guide, instruct and coordinate the University's efforts, whose greatest goal is to signal to everyone the projects aligned with UFRGS's community's aspirations, preserving internal democracy and the autonomy of Units and Departments." In this context, UFRGS presents a detailed analysis on the theme of Internationalization at the Graduate and Research level, considering that its principles are already solidified in the 2016-2026 PDI and were reaffirmed in the 2017-2020 Management Plan (Plano de Gestão).

For Universidade Federal do Rio Grande do Sul, internationalization is a moving process, as the following Institutional Internationalization Plan demonstrates.

1. UFRGS's internationalization in its Institutional Development Plan

The Universidade Federal do Rio Grande do Sul 2016-2026 Institutional Development Plan (PDI), named Build UFRGS's future, was approved by University Council (Conselho Universitário - CONSUN) Decision no. 179/2016 of June 24th, 2016 and it details the University's overall strategy for 2016-2026. As can be expected, internationalization occupies a privileged space in the document, being mentioned as one of UFRGS's values (p. 12) as well as being elected one of the community's relevant factors for the University's future (p. 23). The PDI also underscores that internationalization is a factor in the search for excellence. According to the PDI, UFRGS's vision for 2026 is: "To be a University which is recognized by society as having excellence in all fields of knowledge, nationally and internationally" (p. 24).

The PDI stresses that internationalization must be understood in a comprehensive way at UFRGS, covering Learning (Undergraduate, Graduate and Distance learning), Research, which should be strengthened, recognized and amplified by internationalization, and Extension and Outreach. As well as these factors, Innovation is also mentioned explicitly as one of UFRGS's focuses in its internationalization policy.

The PDI states (p. 28): "One of UFRGS's values of excellence still is internationalization. Thus, the University will keep strengthening its relationships beyond borders, consolidating and amplifying bilateral and multilateral cooperation with international institutions through academic mobility programs for students, professors, and employees, and international programs, with the inclusion of new forms of binational courses."

Regarding future measures, the PDI cites the increase of mobility of all segments; the multilingual character of the University's actions; the development of a policy to promote institutional integration and attract new visiting professors, researchers and graduate students; the emphasis on welcoming measures for academic partners; and the support for the creation of international graduate education programs with
the possibility of expanding joint education agreements (cotutelles and joint degrees) and double degree agreements (p. 40).

2. UFRGS’s 2017-2020 Management Plan and internationalization

Universidade Federal do Rio Grande do Sul's current central administration has devised its 2017-2020 Management Plan, written in consonance with the PDI. One of the academic objectives mentioned is to "amplify internationalization" (1.3) through the development of the present Institutional Internationalization Plan; the promotion of UFRGS as a regional leader in Latin America; the increase of undergraduate and graduate course disciplines offered in foreign languages; the creation of international research projects; the welcoming of visiting foreigners; the promotion of multilingual publications; and the increase of UFRGS's participation in accreditation processes. Under another academic objective (1.4), there is an internationalization goal for increasing undergraduate and graduate modalities with foreign HEIs.

3. UFRGS’s Research and Graduate Studies internationalization strategy

3.1 Main Principle: why should UFRGS internationalize?

UFRGS sees internationalization as a medium for the University to expand its diversity and solidify its excellence. By amplifying options to integrate UFRGS's researchers and students with a higher number of cultures, whether by hosting them at UFRGS or by enabling members of UFRGS's community to travel to other countries, richer experiences are provided to all. This enrichment renovates ideas, further capacitates our students, prepares our community for living in a world that is much more integrated than in the past and produces increasingly qualified knowledge.

The understanding of UFRGS's internationalization objective also highlights two key points. Firstly, internationalizing UFRGS does not mean to merely increase outgoing mobility; indeed, it means to expand multicultural experiences within the University. Secondly, internationalization associates with other structural processes in the modern Brazilian university, such as the opening of the academic world to plurality. It is important to stress that these processes do not antagonize each other; adversely, they are complementary.

3.2 Courses of action

Built from the principle that guides UFRGS’s internationalization and acting as a platform with which to structure the actions described in the PDI and the Management Plan, UFRGS's internationalization strategy at the graduate and research level is divided into the three following axes.

3.2.1 UFRGS and the recognized and sustained excellence with strategic partners of strong scientific impact

UFRGS has cherished historical relationships with all Western European and North American countries; that is, countries of strong scientific impact. Regarding this set of countries, the University's international strategy is based on the institutionalization, along with strategic partners, individual relationships which have existed for decades and can be attested by many bilaterally or multilaterally funded joint researches. UFRGS's objective with these partners is to strive for excellence in research, with symmetrical integration and investment in joint actions.
In regards to these historic partner countries, UFRGS has evidence of its results and contributions, such as coauthored published papers, long-lasting joint research projects, incoming and outgoing graduate student mobility, and, most importantly, joint fundraising through bilateral programs (CAPES/COFECUB, CAPES/PROBRAL, CAPES/Newton Fund, Horizon2020, Erasmus+ Jean Monnet) or unilateral programs, as is the case with Sweden and Norway. UFRGS is also in contact with higher education institutions from countries which have defined excellence programs or networks (Germany, France, Canada, Australia) or countries which have a tradition of partnering with the private sector to fund research; as well as with higher education institutions which approach the University to establish perennial agreements under specific themes.

Two examples from distinct fields are the recently-created European and German Studies Center (Centro de Estudos Europeus e Alemães - CDEA), funded by DAAD, from the human sciences and linguistics fields, which is the only of 21 centers to be located in the Southern Hemisphere; and the CNRS LICIA International Associate Laboratory (Laboratoire International Associé CNRS LICIA), funded by Université de Grenoble Alpes, from the computer science field. In both cases, UFRGS's excellence in research and its collaboration history led to foreign partners proposing new forms of joint work.

The strategy with these countries is to increasingly innovate our partnerships, going beyond traditional academic research, so that UFRGS achieves a more consolidated experience that Northern Europe, Anglo-Saxon countries, or Israel possess in this matter. A recent case, an innovative Erasmus+ Capacity Building project from 2018 to 2020 which Sweden's Uppsala University proposed to UFRGS demonstrates UFRGS's capacity of establishing international mutual-interest partnerships with the best universities of the world on this subject.

3.2.2 UFRGS as an international regional leader: UFRGS within MERCOSUL and Latin America

UFRGS recognizes its central position in Latin America. Many foreign partners from Europe or the United States see Brazil, especially Rio Grande do Sul, primarily from within a Latin American context. Rio Grande do Sul's geographic localization provides UFRGS with a unique position relative to the Latin American countries. Mercosul, though limited by political and economic issues, is an example of regional integration where academic diplomacy has significant potential, similarly to the thirty years of the Erasmus program in Europe.

In the recent years, UFRGS has been expanding its relations with influential countries from the region—namely Argentina, but also Colombia (from which UFRGS welcomes the majority of its foreign doctorate students), México and Chile. UFRGS’s strong initiative to prepare for the next UNESCO Regional Conference on Higher Education (CRES 2018), which will take place in Córdoba, Argentina, allows it to anticipate increasing approaches among the region's higher education institutions.

In Argentina, UFRGS has close ties with universities such as Universidad de Buenos Aires, Universidad Nacional del Litoral, and Universidad Nacional de Córdoba. The excellence network called Association of Universities of the Montevideo Group (Associação de Universidades do Grupo de Montevidéu - AUGM) has enabled the establishment of strong collaborations, due to the close geographical proximity, among researchers in areas of mutual interest. Examples include water and the environment, renewable energies, engineering fields, as well as agronomy and veterinary medicine. UFRGS has also been approached by multiple partners from the regional block to train Ph.D. students, with many perspectives of DINTER-like Msc or Ph.D. programs (Odontology with UDELAR, Hydric Resources Management with Paraguay, Rural Development with Colombia…), anticipating the concrete establishment of international clusters.

In the regional context of Latin America, therefore, UFRGS sees a strong leadership potential which will contribute to amplify the value of its research in well-defined mutual interest fields with equally
advanced universities from the neighboring countries. The strong presence of graduate students from nearby countries at UFRGS will be a key point to its internationalization, guaranteeing sustainable partnerships in the next decades, when these students begin to act as researchers in their countries of origin.

At last, UFRGS understands that these two courses of action complement each other: by reasserting its excellence through strategic partnerships with countries that have a strong academic impact, UFRGS will strengthen its regional leadership in Latin America's scientific community.

### 3.2.3 The BRICS as leaders of new international experiences

UFRGS has been one of Brazil's leaders concerning the establishment of contacts with China and Russia. As to China, the establishment of one of Brazil's ten Confucius Institutes in 2011 has enabled a crucial exchange with several universities, allowing advances in research in the fields of food security and consumer's rights, as well as approaches on the theme of innovation.

2014-2015 saw the start of an essential connection with Russian higher education institutions, with fast advances in the microelectronics, cybersecurity, and public policy fields. UFRGS was one of the first Brazilian HEIs to become a member of two BRICS university associations. In September 2015, the University joined a 25-member elite group, BRICS Universities League, and in January 2016, UFRGS entered three BRICS Network University's research groups under a CAPES initiative.

UFRGS intends to develop these partnerships within the BRICS, as it understands that these countries have a renowned scientific potential and will become world leaders in the next decades. These partnerships tend to have a more specific focus than our standard relationship, which allows for innovative and pioneer actions with very singular results. With the BRICS, innovative partnerships pave the way for the scientific future in an ever-changing world.

### 4 Conclusion

Universidade Federal do Rio Grande do Sul has a clear vision of its scientific potential at an international level, setting complementary objectives in three great regions of the world to enrichen its academic community through the diversity of ideas and to promote the science of an increasing outreach. Alongside countries of strong scientific impact, UFRGS's objective is to reach symmetry in its actions and to advance regarding innovation. At a regional level, UFRGS's leadership in Latin America provides a sustainable base through which to acquire visibility in the rest of the world, as well as to advance issues that are strategic and specific to our country.

Detailing what is stated by UFRGS's Institutional Development Plan in regards to internationalization, this Institutional Internationalization Plan at the Graduate and Research Level is endorsed by the 2017-2020 Management Plan. The actions here described are the basis of our middle term engagement, which, with the support of our academic community, will enable UFRGS to reach a new level internationally.
THE INSTITUTIONAL PROJECT
DIAGNOSTICS

Strengths

Title – A large number of international agreements signed

Justification – Currently, UFRGS has 359 international agreements signed.

Title – Large history of international recognized excellence in Research.

Justification – UFRGS is one of the oldest federal universities in the country. It is located in an easily accessible regional capital, in a State that has strong demographic origins from central Europe and Italy. For these reasons, UFRGS has received prominent foreign researchers since the 1950s, and many of them have helped create our research centers and graduate degrees. Since the 1970s, many professors with M.Sc. titles have been sent abroad to seek Ph.D. degrees in Europe and the United States; upon their return they have incorporated their international research experiences into their departments and fostered new partnerships with foreign groups. Together with CAPES’ continuous efforts to qualify and reinforce studies as the graduate level, UFRGS has achieved a notable concentration of programs whose international excellence is already recognized by the academic community at large.

Title – Management of internationalization institutionalized 20 years ago at UFRGS

Justification – UFRGS’ Office of International Affairs (“Secretaria de Relações Internacionais”) was created in 1998. Already at that time there was the awareness that specific management was required in this respect (at the time, activities were very concentrated on the educational Mercosur). Ample experience in the management of student mobility, at undergraduate and graduate level, has been developed long before its sharp expansion in the years 2012-2015; for example, UFRGS signed its first Double Diploma agreement at graduation only in 2008, as a result of years of student exchange with France. The Deans of Graduate Studies and of Research have had to dealt also with the support and management of programs of Visiting Professor or Visiting Researcher, as well as "sandwich scholarships" (Phd studies overseas), already decades ago; the UFRGS by-law has provisions for the registration of these activities and their follow-up. Internalization has had a prominent place at the university for decades and appear prominently in UFRGS’ internal management documents (Strategic Plan, Anual Management Plan).

Weaknesses

Title – National legislation reticent on the subject of foreign professors and researchers

Justification – Brazilian legislation concerning legal, labor, and immigration requirements imposes on our universities in general - and on UFRGS - a small margin for autonomy in the decision-making process in matters that are important for the visit and sojourn of foreign researchers to Brazilian universities. This contingency may turn into a fragility in years to come and has been identified already as such in our institutional diagnoses.

Title – Complex internal university organization

Justification – UFRGS has five campuses, 27 academic units (one of them hosting thirteen Post-Graduate Programs), more than ninety Graduate Programs and hundreds of CNPq-registered research groups. This fragmented structure, resulting from decades of constant evolution of the teaching and researching personnel, may sometimes hamper the internal and external identification of centers of excellence. The preparation of PII/UFRGS is
an opportunity to organize the isolated research activities in a much consistent way, thus making it possible to reinforce our scientific contributions and minimize the present weakness.

**Title** – Urban and institutional infrastructure

**Justification** – Brazilian cities and their urban conflicts are a potential hazard to the attractive strengths of Brazilian universities. At the same time, resource limitations for the conservation and continuous improvement of equipment and laboratories may be identified as a vulnerability of the Brazilian university system as a whole. UFRGS is not immune to the effect of these circumstances, which may lead to obstacles to attract foreign researchers for long-term stays in the country.

**Do you have a well-defined institutional vocation?**

Yes.

**Describe the vocation of your institution**

The mission of UFRGS, as defined by its Strategic Plan, is "to develop higher education with excellence and social commitment, train individuals, generate philosophical, scientific, artistic and technological knowledge, and use it to promote transformations in the society." The vision in which our community recognizes of itself is "to belong to a university recognized by society as being excellent in all areas of knowledge, on a national and international level."

**Describe other relevant information about the level of internationalization of your institution**

UFRGS consistently ranks as one of the most international universities in Brazil: in the international rankings (QS, THE, ARWU) it appears in the top-10 of Latin American universities. In the national assessments, UFRGS has been consistently ranked as the best among Brazilian federal universities by the Ministry of Education (MEC). Several studies on student mobility carried out by ANDIFES (the Federal Council of University Presidents) show that UFRGS is one of the three universities that receive the highest number of foreign students. Regarding outgoing students, UFRGS was placed in fifth place as contributor to the federal program "Science without Borders" which included undergraduate and graduate students. UFRGS has 36 CAPES rank 6 and 7 graduate programs out of a total of 88 programs; thus, 40% of the university’s graduate programs have been evaluated as having achieved international excellence. UFRGS is also part of prestigious international university networks and associations. It joined the Magna Charta Universitatum led by the University of Bologna in 2016; it is part of the BRICS League, with only four other Brazilian universities. In Latin America, UFRGS belongs to the AUGM (Association of Universities of Mercosur), which promotes, among other actions, leading research among the main public universities of Mercosur’s constituent countries. UFRGS is also adept at attracting foreign funds for research, with British partnerships through the British Council (Newton Funds), with Germany through DAAD (with the creation of the first Center for Advanced European Studies in the Southern Hemisphere, in Porto Alegre, in 2017), with France via the CNRS, INRIA, and INRA, and also with the Fulbright Foundation, the Horizon2020 program of the European Union. Also noteworthy is the unique participation of UFRGS, in a Brazilian context, in Erasmus Mundus consortia from 2009 to 2017, and in Erasmus+ projects since 2016, the Brazilian university with the highest visibility in these programs. To illustrate the cutting-edge international research produced at UFRGS, our data show that UFRGS published in Scopus 15,029 articles, and 13,191 in the Web of Science, in the period 2014-2017. Among the 100 most cited articles in the history of Brazilian science, according to Scopus Base, as of January 2018, nine are from UFRGS. Professor Flavio Kapczinski was one
of only two Brazilians considered "Highly Cited Researchers" in the 2017 survey conducted by Clarivate Analytics; he is among the top 1% of the world's most cited researchers.
INSTITUTIONAL PROJECT

Institution of the Coordinator of the Project UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL

General Goals

The establishment of international qualifications at UFRGS and their integration to the academic milieu is the general objective of the Institutional Internalization Project (IIP). The IIP aims at symmetrical partnerships with highly qualified institutions, as a means to amplify the current research and graduate studies objectives at UFRGS, thus complementing the and contributing to the honing of the areas of competency and knowledge in which the University operates. A institutional diagnosis undertaken in January 2018 was instrumental to the definition of the general objective of the IIP; it confirmed that UFRGS is a highly internationalized university, with current interactions with 364 foreign universities from the United States, Italy, England, Canada, France, Norway, Spain, Holland, Germany, Argentina, Australia, Austria, Denmark, Sweden, Russian, Ireland, China, Belgium, Japan, and New Zealand. These interactions constitute effective cooperation between UFRGS and these universities and countries; their results have been relevant, both quantity- and quality-wise, and they indicate the possibility of their growth along the general guidelines of this Project. As a highly internationalized university, and one of the academic leaders of Brazil, UFRGS views the general objective of its IIP as the solidification of the recognition, by the world-wise foreign partners with which UFRGS collaborates and interacts, of the effectiveness of their joint products of knowledge; this will come to enrich and strengthen UFRGS’ local actions of internationalization. Sixty-five graduate programs will collaborate in the development of the IIP; these internationally qualified Programs (graded 7, 6, 5, and 4 in [CAPES’] Quadrennial Evaluation 2013-2016) are responsible for the expressive scientific results detected in the January 2018 diagnosis.

The general objective of the IIP takes into consideration UFRGS’ current level of internationalization which that is attested by the numerous scientific papers published between 2014 and 2017 (15,029 in Scopus and 13,191 in Web of Science). It is of note that among the hundred most quoted papers in the history of Brazilian science, also according to Scopus as of January of 2018, nine articles were produced at UFRGS; the first author of the most quoted Brazilian scientific paper is a researcher of our Physics Institute; this article was instrumental to the awarding of the Nobel Prize in Physics in 2007. In the 2017 Clarivate Analytics annual survey, a researcher of UFRGS’ Medicine faculty was one of only two Brazilian scientists considered “Highly Cited Researchers” in 2017, while in 2016 he was one of only four so considered, being among the 1% most quoted scientists in the world. Beyond these clear signs, it is of note that UFRGS has a fundamental participation in the German and European Studies Center – the only one located in Latin America. The university is home also to a Confucius Institute, and has scientific relevance to LICIA. UFRGS’ researchers have being called upon to participate in European scientific projects such as FP7 and Horizon 2020. A series of international collaborative modalities exist at UFRGS today, including mobility programs for faculty and students, co-financed research projects, and high impact publications with joint autorship. Joint graduate degrees are on offer by the University’s graduate programs; our graduate programs take part regularly in international calls and agreements proposed by Brazilian and foreign financing and academic agencies. The strengthening of partnerships, the call for international talents, a higher visibility among international partners, and symmetrical relationships with universities of excellence, are among the objectives of the IIP. To this end, the IIP is clustered around eight great themes which were proposed to the participating graduate programs, taking into consideration their self-declared lines of action, their actual research projects, their scientific output, their responsibility to the building of knowledge and the formation of high-level human resources, and the level of consolidation of their international partnerships with well-ranked international university and research institutes. These eight themes align to national priorities for graduate studies and research, in parallel to the thematic and innovative challenges of international investigation. The specific objectives of the eight themes are integral to the general objective of the IIP. These themes are as follows: theme 1 – research on sustainable development under diverse perspectives, the integration of the
university in discussions and investigative forums on climate changes, aiming at the establishment of a research network for the study of sustainable development; theme 2 – expansion of studies on STEAM (Science, Technology, Engineering, Arts, and Mathematics) and the inception of research projects with STEAM as their focus; theme 3 – the study of new technologies, establishing investigative networks on the future of work and the impact of new technologies; the creation of new study areas and/or graduate programs on new technologies and professions; theme 4 – the deepening of translational medicine-oriented researches and the study of national and international programs for the promotions of health and their economic impact; theme 5 – the investigation of non-polluting or recyclable sources of energy and the establishment of networks for the study of the use of new fuels; theme 6 – the study of cities according to good international practices, including the insertion of 4.0 industry in a Brazilian context, and the development of a research network on circular economy applications; theme 7 – the investigation of agriculture, and its new and/or alternative technologies for food security, as well as the study of agriculture topics of national interest and the establishment of networks for the study of food security; theme 8 – the formation of high level human resources and the permanent qualification of the university’s graduate programs, amplifying the international experience of their graduate students and the opening up of their international expertise to the community at large.

The eight Themes of the Institutional Internationalization Project are to be viewed not as an arbitrary compound of topics but rather as a further strengthening of the rich scientific potentialities of the University, and they coincide with the numerous partnerships on offer all over the world. Their objective is the continuation of UFRGS’ insertion in international fields of research. The eight themes are an integral part of the IIP; their symmetrical articulation with the international research communities is to be viewed as the exploration of avenues into the future, rather than a mere solidification of the present. The IIP counts on UFRGS’ solid organization, which includes the School for the Development of Technical Personnel (EDUFGRS) that offers courses which meet various expectations of UFRGS’ employees, including courses on foreign languages – English, French, Italian, and Spanish – and qualifications on many aspects of the internationalization of Brazilian and foreign universities. In this respect, UFRGS is a leader among Brazilian academic institutions. The IIP will use also structural departments of UFRGS that have been instrumental in their support to internationalization actions: among them are the Office of International Affairs, the Office of Institutional Agreements, and the Vice-Presidency for Student Affairs. Since their respective inceptions, these departments have acquired organizational and technical capabilities to prepare faculty and students for their period of residency in foreign institutions and to ensure that the knowledge and experience acquired abroad will be shared with UFRGS’ academic community, contributing to its internationalization. The general objective of the IIP will be implemented in ways that favor the transparency and universality of the University, also in its financial aspects, as its focus is the balance between financing and the reinforcement of academic actions with international partners as a way into the development of strong and original partnerships of high scientific value. These are, in short, the guidelines of UFRGS’ Institutional Internationalization Project.

THEMES AND SPECIFIC GOALS OF THE PROJECT

Theme 1

**Theme** – Sustainable development, diversities, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal aspects

**Partner countries** – Spain, Australia, Denmark, Finland, China, France, Portugal, Holland, Norway, Sweden, United States, Italy, Germany, Canada, Belgium, United Kingdom, Chile, Switzerland.

**Justificative** – Sustainable development constitutes one of the main challenges in today’s society. It is instrumental, therefore, that investigations on this topic take into account aspects of history, politics, culture, ethics, and legislation.
Goal – The integrated study of sustainable development under a diversity of perspectives.

Description – The integration of biological sciences, glaciology and geosciences, as well as human, social, and applied sciences, engineering, technology, international, environmental and technology law, including the focus on the strategic role of water in Brazil.

Theme 2

Theme – Integration of Basic Science, Information Technology, Engineering, Arts and Mathematics [STEAM]
Partner countries – United Kingdom, Holland, France, China, United States, Italy, Spain, Belgium, Sweden, Germany, Canada, Australia.
Justification – Current studies indicate sizable benefits for human development in various levels through the integration of basic sciences, information technology, engineering, arts, and mathematics (STEAM).
Goal – Expansion of projects that involve STEAM integration.
Description – Innovative scientific results may occur through the integration of basic sciences, information technology, engineering, arts, and mathematics; this theme takes into account that the international insertion of UFRGS’s visibility occurs in multi- and inter-disciplinary forms; these, in turn, qualify the scientific output of the university as a whole.

Theme 3

Theme – Impact, development, access to and insertion of new technologies, artificial intelligence, information technology and robotics in the future of work
Partner countries – Argentina, Italy, Germany, Portugal, Canada, Denmark, China, Holland, Russia, United Kingdom, France, Australia, Belgium, Norway, Sweden, United States, New Zealand.
Justification – Considering the speed that characterize current times, it is of essence to develop studies on the impact, access to and insertion in new technologies, as well as their reflexes on the future of work.
Goal – The study of new technologies.
Description – To investigate new technologies (AI, information technologies, and robotics) in view of the future of work and human relationships; to investigate the consequential establishment of social groups, corporations, organization and strategic relations between countries and geopolitics, in a multi-perspective that involves the humanities, social sciences, applied sciences and technological areas.

Theme 4

Theme – Large-scale Health Sciences, Translational Medicine and its socio-economic impact
Partner countries – New Zealand, Canada, Australia, United Kingdom, Portugal, Italy, Austria, France, Holland, Norway, United Stated, Belgium, Spain.
Justification – Large scale health programs constitute one of the most important elements to ensure good living conditions to world populations; it is of essence that this theme be investigated, considering new models, good international practices, and social and economic aspects.
Goal – Advancement in large-scale Health Sciences.
Description – The integration of health sciences and medical, biological and technological areas, with focus on socio-economic impact and innovations on the management of Brazilian health systems.
Theme 5

**Theme** – Energy of the future, new fuels, non-pollutants and/or recyclable.

**Partner countries** – United States, Italy, Holland, France, Canada, Spain, China, Argentina, Portugal, Belgium, India, Australia, Sweden, Germany, United Kingdom.

**Justification** – The sources of energy in use in transportation and in the industry are changing rapidly; thus, it is necessary to deepen our knowledge on the conversion and storage of new predominantly non-polluting and recyclable forms of energy.

**Goal** – The study of non-pollutants and/or recyclable sources of energy.

**Description** – The integration of basic sciences, engineering, and technology for the investigation on the energy of the future, including new, non-polluting and/or recyclable fuels.

Theme 6

**Theme** – Smart cities, complex urban areas, 4.0 Industry and circular economy

**Partner countries** – United States, Canada, Belgium, Chile, Germany, Italy, Spain, Australia, Holland, India, France, Sweden, Portugal, United Kingdom, China.

**Justification** – Smart cities may be a solution to dense and complex urban areas; 4.0 industries and sharing economics may contribute substantially to the establishment and management of smart cities.

**Goal** – The study of smart cities and complex urban areas.

**Description** – Smart cities, complex urban areas, 4.0 industries, and sharing economics may be integrated through their specific technologies; in so doing, the investigation of their direct impact will be accessed, especially in respect to their impact on life in large portions of the world population in great conglomerates of urban complexities around the year 2050.

Theme 7

**Theme** – Research on agriculture, supply chain and food safety

**Partner countries** – United States, Holland, Belgium, Chile, France, Switzerland, India, Spain, Australia, Argentina, China, Switzerland, United Kingdom, Italy, Germany, Portugal, Canada.

**Justification** – Agriculture is one of Brazil’s most important sectors and it needs researches on the safe production of healthy foods, including the introduction of new technologies, the gain in value, the maintenance of productivity levels and food security.

**Goal** – Research on agriculture, food chains, and food security.

**Description** – To investigate the numerous challenges tied to urbanization, population growth, economic and environment sustentability (particularly in relation to water consumption); to investigate the integration of multiple areas of knowledge that require possibly disruptive innovations to meet the various challenges tied to productivity.

Theme 8

**Theme** – Education of high level human resources for activities in strategic areas
**Partner countries** – United Kingdom, Germany, Italy, Argentina, Finland, Canada, Chile, Switzerland, China, Colombia, Spain, Australia, Norway, Portugal, Holland, Belgium, Sweden, Denmark, United States, India, New Zealand.

**Justification** – In the context of information and knowledge societies, the formation of highly qualified human resources is a priority, in their capacity to analyze questions and propose policies for technological, historical, social, cultural, and institutional development, so as to bring Brazil to a new paradigm of sustainable development, aiming at the betterment of knowledge in all of society’s sectors.

**Goal** – Formation of highly qualified human resources.

**Description** – Formation of highly qualified and diverse human resources, aiming at their capability to foster incremental and disruptive changes, so as to lead Brazil into a new paradigm of sustainable development, with the consequent betterment of knowledge in all of society’s sectors.

### POSTGRADUATE PROGRAMS LINKED TO THIS PROPOSAL

#### Theme 1

**Theme 1** – Sustainable development, diversities, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal aspects

**PPG¹** Grade in the Quadrennial

**Botany** 5

**Background**

A large part of the research activities of the PPG on Botany fits the theme “Sustainable Development; diversity; climate change; environmental, social and economic sustainability, including ethical and legal aspects”, with a focus specifically on diversity (more specifically, the plant biodiversity in its various levels of organization, and whereas taxonomic aspects/evolutionary, ecological, physiological and morphological, as well as questions applied to the management and conservation of biodiversity), but also linked to the theme of sustainable development (e.g., sustainable use of certain species of plants) and climate change (e.g., studies on the effects of global climate change on plant biodiversity). It should be emphasized that the challenges in the use of resources are of global importance and require, for the development of solutions, research activities in the international context. PPG on Botany has as objective the qualification of human resources for the exercise of scientific research and education in botany, through advanced studies and research oriented in four areas of concentration: Systematics, evolution and ecology of algae, plants and fungi; Plant ecology; plant morphology; Plant Physiology. In the scope of its activities, the program has contributed in various ways for the advancement of scientific knowledge in the field of botany, both through training qualified professionals – many of them are today teachers and researchers in other institutions of higher education -, as well as the production of high-level scientific publications and dissemination of research results. The majority of research projects aims to achieve a better knowledge of the Brazilian biodiversity (at several scales, the gene until the ecosystem), its operation, its possible uses, and their conservation. Even though the focus of many research activities are species or ecosystems in the southern region of Brazil, today the majority of research activities on biodiversity needs also a broader perspective. This is so due to the need to insert the Brazilian species phylogenies in the group in question, or by the global potential of the use of plants for medicinal purposes, or for reasons of conservation and sustainable development that need to be addressed in a larger context. In other words, today’s research on biodiversity is international research.

**PPG Grade in the Quadrennial**

**Rural Development** 6

**Background**

The Research Group Desertification/arenização and environmental issue, counting more than 25 years of research on this theme, has developed several projects and participated in the debate on the theme in different territorial scales (from local to national). This is an issue of relevance to Rio Grande do Sul, which is articulated with the research conducted on the theme of desertification in NE Brazil, built through national and international partnerships, including guidelines for master's and ph.d. degrees students coming from this region and abroad. Among the international partnerships performed, stands the Capes- Cofecub agreement, with the Le Mans Université. Recently, there was the adoption of a new project, within the framework of the Capes-Cofecub agreement, between the two universities, for

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¹ PPG – Programa de Pós-Graduação; Graduate Program
the period 2017-2020, which deals with the qualities of the products of the Territorialisation in Rio Grande do Sul - QUALPROSUL, having as a geographical area of interest the Pampa and three lines of research: 1) the promotion of agricultural products by their territorial anchoring; 2) the production systems and the negative impacts to the environment and natural resources; 3) the way as the producers perceive their practices, considering on benchmarks of culture, tradition and power relations. The Nucleus for Extension in Territorial Development acts in extension and research, fulfilling the role of advisor for the rural territories Coast and Campos de Cima da Serra in Rio Grande do Sul, as well as participating in the network of NEDET of Rio Grande do Sul. Among the objectives of NEDET is the support for rural areas in the implementation of processes of social inclusion of family farmers, indigenous and traditional communities, women and young people, aiming at achieving sustainable development. The Nucleus of Studies in Sustainable Rural Development and Forest acts to implement processes for the conservation of biodiversity, in particular Mata Atlântica and Pampa, enhancement of biodiversity, in particular, family farmers, artisanal fishermen, remnants of quilombos and Guarani indigenous people in the state of Rio Grande do Sul. In partnership with the Oriented Network for the development of Agroecology - RODA and Universidade Estadual do Rio Grande do Sul, we developed research on the agroforestry system, including the productive system, the organization and the institutional arrangement.

PPG Grade in the Quadrennial
Visual Arts 5

Background
Concerning the theme of sustainable development, diversity, climate change, environmental, social and economic sustainability, including ethical and legal aspects, we observe that the historic, theoretical and expressive dimensions of contemporary visual arts have remarkable influence on ethical, aesthetical and critical reflection of the interfaces among man, society and nature.

PPG Grade in the Quadrennial
Social Anthropology 7

Background
The PPGAS has various active groups in this theme. SobreNaturezas Group: conducts studies about nature, culture, with emphasis in the intersection between ecological and religious practices, which give rise to processes of sacralization of nature and of naturalization of the sacred. Another aspect highlighted by the group is the environmentalization of social institutions and the educational and religious movements and the displacement of the notion of classical political citizenship for the "environmental citizenship". NUPECS - Center for Research on Contemporary Cultures: develops research in the dynamics of contemporary cultures. It is dedicated to the study of practices, interactions and social representations of and from the urban environment. NUPECS deals with topics such as tradition and modernity, globalization, construction of new cultural borders, modern city, imaginary, cultural identities, social representations, music, the fear and the crisis in the urban context, everyday life, forms of sociability, feeding, poetic and visual narratives, ethnographic collections, ecological heritage and cultural policies, representations about the economic, social and symbolic meanings of money, consumption, sports, mega events, politics and power, social movements.

NIT - Nucleus of anthropology of indigenous and traditional societies: studying indigenous collectivities (Indians and peasants), disseminating their results and attending demands related to these populations. The Group Espelho Animal and Grupo de Estudos Multispecies, Microbiopolitics and Technosociality, which investigates human-animal relationships in contemporary societies, through a qualitative and ethnographical approach. Among the researches, studies on the ontological and ethical status of companion animals, production and experimentation; ethnographies of the new practices and sensitivities to animals; as well as the emergence of new political, social and cultural rights involving animal issues in the contemporaneity. Currently two researches are emphasized: multilocation research, where an ethnography of policies and practices of surveillance, prevention and control of Aedes aegypti in different cities of Brazil and Argentina is being conducted, including the concerns with yellow fever, dengue, the zika and Chikungunya; and a research whose focus is the emerging problems relating to the leishmaniasis, and its broad scope of social impacts, especially in the peripheral countries.

PPG Grade in the Quadrennial
Architecture 5

Background
The Program has promoted educational and research activities that fall under the agendas of environmental, social and economic sustainability, especially regarding the recognition, preservation and reuse of the modern built patrimony, as well as regarding the critique revaluation of modern experiences, while the basis for the construction of the contemporary architectural thought. These activities aim to the formulation and the fostering of theories and practices of the architectural project committed to the amplitude of the current challenges for urban and environmental sustainability. These activities have involved the participation in international research networks, and contributed both for the dissemination of research carried out in the program, through the actions of teachers and students at congresses, seminars and courses outside the country, as well as invitations to foreign professors to teach seminars in the program. It is emphasized, in research activities, the actions of the program in the Docomomo International (DOCOMOMO - Documentation and conservation of buildings, sites and neighbourhoods of the MO dern MOvement), an organization dedicated to the documentation, study and preservation of patrimony of the modern movement in architecture, aiming at the development and dissemination of good practices for environmental sustainability, from the
perspective of the architecture and urbanism, establishing a research network that involves university institutions in more than 60 countries. As formalised cooperation, we highlight the program's participation in joint research projects involved in this agenda, already completed and with published results, such as: joint project of research supported by CAPES PPCP Program-Mercosur; joint project of research with the program of Phd in projects of Universitat Politècnica de Catalunya; joint project of research linked to the preparation of the Latin American exposure in Construction: Architecture 1955-1980 (MoMA, New York, 2015); The Museum of Modern Art, Columbia University (United States). It is also worth mentioning the protocol of cooperation with the Hochschule Ostwestfalen-Lippe (HS OWL), Germany, which also allowed academic missions linked to the theme of sustainability in architecture. Regarding formative activities, the program promoted in the last four years activities that have environmental sustainability as the theme, according to different perspectives, comprising international guests, from various countries.

PPG Grade in the Quadrennial
Computing 7

Background
The researchers from the Graduate Program in computing work on this subject through research projects and related activities: - Research Project (2016-2018) with the participation of the UFRGS by Prof. Philippe Navaux titled: HPC4E (High Performance Computing for Energy). The project was selected in the third call BR-Europe and is jointly financed by the European Union. The project is conducted in partnership with Barcelona Supercomputing Center (Spain), INRIA (France), Queen Mary University of London (UK). - Project (2016-current) and research led by Professor Marcus Ritt, on territorial organization for agrarian reform and environmental planning - Development of heuristic and exact algorithms. Research project in partnership with UFL and USP/SC, but with potential for collaboration with Technical University of Munich - TUM (Germany).

PPG Grade in the Quadrennial
Design 5

Background
The Graduate Program in Design has a strong presence in this theme, where the development of several studies may be highlighted, which resulted in theses, dissertations and publications in the following themes: - Contribution to the ecodesign (DFE) from properties of blends PC/PMMA in successive cycles of processing; - Development of a mini vehicle fairing aiming efficiency based on Bionics; - Reuse of cardboard tubes: a study of technical parameters aiming at the application in the design of products; - Proposition of a methodology for the design of packaging oriented to sustainability; - Digital Fabrication: systematization methodological basis for the development of artifacts with an emphasis on environmental sustainability; - Design, Planning and 3D technology in cultural preservation in support of sustainable material: a case study of the "Laçador" monument; - Systematization of design procedures for environmental sustainability for application in teaching project methodology; - Ecodesign in processes: (Re)use of effluents from the process of dyeing agate for artificial coloring of the basalt carijo; - Systematization of principles of nature's solution for application in the creative process of product design; - Ecodesign: development of pictograms for the aid of the disassembly of products; - Contribution to the study of leather waste: a holistic approach to eco-design focused on children's shoes; - Cycles: studies of jewelry ecodesign cases. - Design, innovation and sustainability: recycling study of polymer multi-material products without prior separation.

PPG Grade in the Quadrennial
Civil Engineering: Construction and Infrastructure 5

Background
The theme of sustainable development has been the object of research by several professors of the PPGCI for quite some time. Thus, several studies undertaken by different laboratories of the PPGCI fall in this theme, comprising the development of new materials and technologies, improving the performance of buildings and infrastructure, increasing the durability of the built environment, and methods of management. Some of the activities involve collaboration with other programs of UFRGS, particularly the PPGEP (Industrial Engineering) and the PPGE3M (Materials, Mining and Metallurgical Engineering), among them, we can highlight activities and research as: - International Academic Cooperation related with the theme Life Cycle Analysis. - Cements of low environmental impact: the PPGCI is the national leader in this line of research. - Management of Risks and Fire Safety and Management of work safety. - New materials, sustainable technologies and sustainable development. - Working Group on Sustainable Development of ANTAC Technology (National Association for the Built Environment) and creation of ELECS (Latin American Meeting in buildings and Sustainable Communities), which already had 11 editions. - Aluminates hydration and interaction between cement and additives. - Composite cement materials applied in civil engineering with use of polymeric fibers and industrial waste. - Structural reinforcement with composite materials. - Concrete Technology. - Reduction of production losses in construction.

PPG Grade in the Quadrennial
Electrical Engineering 6

Background
This theme is aligned with two areas of concentration of PPGEE: (i) Energy and (ii) Control and Automation. The activities in these areas are concentrated on the following topics: - Integration of renewable sources of energy, notably...
wind and solar energy, the national electrical system. - Efficiency of renewable sources of energy. - Control and automation of renewable sources of energy. - Smart grids. - Development of electrical machines of high performance. Therefore, the affinity of the researches carried out with the proposed theme, justifies the inclusion of PPGEE this theme.

PPG Grade in the Quadrennial
Biological Sciences (Physiology) 5

Background
The PPG Physiology has several actions and projects in this theme, summarized below. Collaboration with the University of Algarve (UALG), where a comparative study of staniocalcinas in regulating calciotrópica and metabolic activity was developed. Agreement Grices/CAPES for two years, visits of Professors John Cardoso and Adelino Canário to Brazil; Visit of professors Luiz Kucharsky and Roselis to Portugal; Post-doc of Vanessa Schein. Prof. Anapaula S. Vinegar received a grant for a work mission in 2015 by BBICE+ program of the Institut de Recherche pour le Développement (IRD) and was in Faro, where she developed a research project in collaboration with Dr. John C. Cardoso and Dr. Adelino Canário of CCMAR. Collaboration with Institute of Marine and Environmental Technology (IMET), the Center for Environmental Sciences at the University of Maryland University of Maryland - Center for Environmental Sciences, UMCES. Prof. Anapaula S. Vinegar received a grant for short-term mission of PROPG in 2012 and went to Baltimore, where she established the first contact with the IMET program. This visit resulted in a collaboration agreement between UFRGS and the IMET program. In June 2013, received a senior scholarship from CAPES, and spent a year doing research on endocrinology, metabolism and pathophysiology of decapods crustaceans in partnership with Dr. Sook J. Chung and Dr. Eric Schott. Since then, they have maintained the partnership to work with these two researchers. Dr. Eric Schott visit UFRGS in November 2015. Collaboration with the University of Bologna (Alma Mater Studiorum - UNIBO), Italy. Prof. Marcia Trapp carried out a post-doc stage, in the year of 2016, in the Dipartimento di Scienze Ambientali Biologiche, Geologiche and di Ravenna, campus of the University of Bologna. Italy, under the supervision of Dr. Elena Fabbri and has kept working in partnerships with this researcher. The work studies the occurrence and tissue distribution of receptors for serotonin (5-HT) in marine invertebrates. Dr. Elena Fabbri was in Brazil in the year of 2017 participating in the IUPS World Congress - Rhythms of Life. Moreover, Prof. Elena Fabbri coordinates the program of International Master Erasmus Mundus Master WACOMA (Water and Coastal Management) and prof. Marcia Trapp is a member of the Brazilian team connected to this program.

PPG Grade in the Quadrennial
Administration 5

Background
Among the topics addressed by the projects are those relating to sustainable development in their various perspectives, innovation and competitiveness, and to the qualification of human resources at a high level, which are investigated in the context of societies and organizations. In this way, the program contributes for the high level qualification of intellectual capital to engage professors and students in teaching, research and extension activities that are effectively aligned to research lines of the PPGA and the demands of the country as a whole. In the last three years, the professors of the program developed international cooperation with 46 different international institutions, especially involving countries such as the United States, France and the United Kingdom. The main activities performed were international missions and research projects with the partners, which resulted in joint publications and exchanges of students and professors. It should be emphasized that more than 75% of program professors developed research projects in conjunction with institutions at international level in this period. At least 18 students participated in a sandwich with these partner institutions. In addition to international institutions in which there is cooperation projects coordinated by PPGA/UFRGS, the Program also participates in joint projects under the coordination of other partners, both at the national and international level. Among the external partners we highlight the Université de Tunis (ESSEC Tunís - Tunisia), Escuela Politécnica Nacional (Quito - Ecuador), Milano Management School (New York - United States), Wageningen University (Netherlands), University of California (Bren School, Santa Barbara - United States) University of Vale dos Sinos (Unisinos), Embrapa, Universidade de São Paulo and Getúlio Vargas Foundation (FGV). We also held projects in partnership with various graduate programs of UFRGS, such as: Agribusiness, Rural Development, Industrial Engineering, Center for International Studies on government, law, Computers in Education.

PPG Grade in the Quadrennial
Agribusiness 5

Background
The program performs research activities, qualification of human resources and international collaboration that justify its actions in this theme. The PPG-agribusiness has two lines of research: (a) Analysis of productive chains; and (b) Management and organization of agribusiness. The scope of these lines of research allows our production to be related with the different topics highlighted in this theme. In addition, for the foreseeable future the Program will create a new line of research in Bioeconomy and Agribusiness, thematic linked to this theme. To meet the research lines, the PPG posses a list of disciplines whose topics are related to this theme. It is worth noting some of these subjects with

PPG  Grade in the Quadrennial
Food Science and Technology  5

**Background**
The program conducts research projects that deal with the characterization of native products of typical biomes of RS and Brazil. Therefore, these projects are clearly related with this theme, because it has strong appeal regarding sustainable development and diversity. Many of these projects involve international cooperation, being conducted by teachers and students of PPGCTA in conjunction with researchers abroad. Several projects have investigated various food pathogens and issues related to the implementation of systems for food safety management in food industries and food services. These include innovative methodologies for control of pathogens in foods, such as the E. coli O157, Salmonella and Listeria, through the use of nanotechnology, rapid detection methods and methods of analysis using "omic" tools. These projects also provide subsidies for the development of technical work related to food security and drafting of laws with national regulatory bodies and organizations such as the Codex Alimentarius, PAHO/WHO, MAP, ANVISA, VISA/RS, VISA of Porto Alegre and other municipalities. For example, a PhD project of PPGCTA, along with the MAP and large slaughterhouses-fridges exporters, aims to calculate the risk of infection by Salmonella through chickens and eggs; another project involving a PhD student of PPGCTA of Mozambique, is developing a proposal for health legislation for food services in Maputo city. Several projects in the framework of PPGCTA aim to research and obtain natural compounds and nanocomposites from agro-industrial wastes, for the development of new technologies and new materials, with the inclusion of natural substances with actions beneficial to the human body, in the absence of toxic compounds and without negative impacts on the environment. These projects have been working in the development and improvement of methodologies to increase the content of bioactive compounds naturally present in foods, and obtaining of flavorings, antioxidants, preservatives and natural pigments for biotechnological processes and green technology, adding value to the agribusiness products.

PPG  Grade in the Quadrennial
Applied Mathematics  4

**Background**
With respect to this theme, researchers from our program have been working on issues involving the mathematical modeling of the phenomena associated with climate and climate change. There is a research group coordinated by Prof. Leandro Farina, who acts in the monitoring and modeling of ocean waves, and a research group, composed by Prof. Marco Túllio Vilhena and Cynthia Feijó Segatto, which applies methods of transport theory of particles to the study of the dispersion of pollutants in the atmosphere. The group of studies in monitoring and modeling of ocean waves is developing activities about the oceanic regional refinement to improve the simulations of different climate change scenarios. Specifically, we plan to perform the refinement oceanic regional ("downscaling") to the coast of the state of Rio Grande do Sul and Santa Catarina, from the simulations of climate scenarios provided by the BESM ("Brazilian Earth System Model"). The final goal is the prediction of dimension of flooding of coastal region, to serve as a tool for management and mitigation of the effects of climatic changes in these regions, due to the loss of coastal habitats and infrastructure. Another activity concerns the development of systems for forecasting of waves per ensemble of latest generation using mathematical models. Operating systems of forecasting of waves per ensemble are usually based only on members of field wind obtained from atmospheric models. Thus, the disruption of the initial condition and the mistakes of the wave model are not incorporated and variations in forecasts are made purely by means of systems of atmospheric sets, which are usually based on singular vectors, "breeding vectors" and Kalman filters. In our current studies, the modifications are introduced in members of the field of wind obtained from the systems of weather forecasts by ensemble. These modifications are based on three steps: i) orthogonalization and decomposition of the members of the field of wind by dimensionality reduction methods; (ii) Comparison or assimilation of observational data by remote sensing of high resolution and iii) additional calibration based on statistical data and/or errors of uncertainty of the model.

PPG  Grade in the Quadrennial
Animal Biology  5

**Background**
The Graduate Program in Animal Biology has its activities focused on research and training of skilled professionals for the study of biological diversity at various levels, from populations to communities. In this sense, the knowledge of biological diversity, since the identification of populations and species, the evolution of these bodies and the ecological and historical factors that determine their patterns of distribution, enables the identification of patterns and process generators and maintainers of biological diversity, essential for the understanding and formulation of policies for sustainable development. Since its creation, the Graduate Program in Animal Biology account with an abundant
scientific production and qualification of professionals in the areas of description of biological diversity; studies of phylogeny and biological evolution based on morphological and molecular characters; biogeographical analysis since the level of populations at higher taxons; biodiversity studies of the aquatic, terrestrial or parasites; and studies of management and conservation of wild and domestic animal species. The research groups of the program have also sought the application of advanced methods of analysis, in order to provide the qualification of high level professionals, entitled to participate in processes related to the establishment of public policies for research, dissemination of knowledge, and sustainable development.

PPG  Grade in the Quadrennial
Public policies  5

Background
The professors of the research line of public policies, culture and social dynamics are involved in agreement with France on: Gender, kinship and sexuality in the contemporaneity - comparative study, coordinated by PPGAS/UFSC. This project has provided work missions for professors and students of the UFRGS, visiting the University of Toulouse in France. With the Netherlands we held the project: transnationalization of Religion, between UFRGS and the Vrije Universiteit Amsterdam, developed under the Program CAPES/NUFFIC. Work missions were carried out by means of scholarships, sandwich Phds, thesis defenses in co-tutela, as well as the carrying out of research, conferences and publications. It also aims studies on informational media and networks that connect religious institutions and agents in the current context of globalization, especially in South America and Africa. Coordination: Prof. Ari Pedro Oro, Graduate Program in Social Anthropology (PPGAS), Participation: Prof. Carlos Alberto Steil from this PPGPP.

PPG  Grade in the Quadrennial
Physics 7

Background
Study of water: Water is a natural resource whose importance dispenses further discussion. Cleaning and treatment of water requires development of cutting-edge technologies, strongly based on microscopic models. The PPGFis through the work carried out by the group of Prof. Marcia Barbosa is at the forefront of this field. The area of Physics of materials is one of the strengths of PPGFis. Advanced Materials with new properties, are indispensable for the advancement of almost all topics listed in this theme; the PPGFis also highlights actions in nanostructures, sustainable development, diversity, climate change, environmental sustainability, social, economic, including ethical and legal aspects. The PPGFis develops, also, new materials for purification of liquids. In this line, we highlight the development of a filter to clean water of heavy metals and salt, and self-cleaning materials.

PPG  Grade in the Quadrennial
Geography  6

Background
There is long experience in this theme, through the different research groups and dissemination of issues relating to sustainable development, environmental socio-economic sustainability. a. Polar and Climate Center (CPC) that brings together international researchers dedicated to the investigation of the role of the glacial environment in the climate system (in particular the Antarctica), the climate and palaeoclimatology from North Africa and southern climate changes. The Center fosters the development of research in atmospheric sciences. The CPC is the headquarters of the National Institute of Science and Technology of the Cryosphere, which integrates the scientific community dedicated to the study of the variability of different components of the planetary mass of ice (Antarctic marine ice, glaciers and the mantle of antarctic ice, Andean glaciers, permafrost) and its response to climate change. The CPC meets the demands of the Brazilian Antarctic Program. The international integration of the CPC is emphasized by the vice-chair of the Scientific Committee on Antarctic Research (SCAR) from the International Council for Science (ICSU), and collaboration with the Climate Change Institute at the University of Maine, USA). b. Research Group Desertification/sandstonization environmental issue - which has developed several projects, and participated in the debate at different territorial scales (from local to national). Among the international partnerships we highlight the agreement UFRGS/Le Mans Université. Recently, there was the adoption of new project, within the framework of the Agreement Capes-Cofecub, between the two universities, for the period 2017-2020. c. Nucleus of Studies in geography and environment (DENY), in this group we are developing map surveys and environmental analysis - planning, with emphasis on the conservation units. We also highlighted the exchange with the University of Entre Rios (Argentina), through CAPES-MERCOSUR program.

PPG  Grade in the Quadrennial
History  6

Background
Since its creation, the PPGH performs movements of internationalization, expressed, for example, in the wording of one of its lines of original research focused on the Platina history. In this perspective, its founders established important connections with colleagues from other countries of the Southern Cone so that the theme of international cooperation has always been central to the discussions held by professors and students of the Program and its consolidation strategies in the academic scenario. With the passing of the years, this theme has come to include other
regions in Latin America, Europe and Africa, bringing about the exchange of professors and students with universities of these continents, and in conducting research projects. Recent agreements with this purpose are: - JOINT PROJECTS MERCOSUR: "Intellectual Networks and spaces of frontier: beyond the scope of the nation state", integrating the UFRGS, Universidad Nacional de Cuyo (Argentina) and the Universidad de la Republica (Uruguay) and, as associated universities, UFSM and Universidad Nacional de Mar del Plata; - PROJECT ASSOCIATION OF UNIVERSITIES GROUP Montevideo (AUGM) - Academic Committee History, regions and borders, which, besides the PPGH, gathers Brazilian researchers from UFSM and Unicamp, argentineans (UBA, UNCórdoba, UNRosário, UNTucumán, UNLitoral, UNMar del Plata), Chilean (USACH - Universidad de Santiago, Chile and Uruguay (UDELAN - Universidad de La Republica); - PROJECT AFRICAN SOCIETIES IN THE PAST AND IN THE PRESENT: mutations, adaptations, multidisciplinary network of African Studies, linked to the Latin American Institute of Advanced Studies of the UFRGS, includes researchers from UFRGS, USP, UFBA, UFMG, UNICAMP, EHESS - Paris, Birmingham (UK), Brown (USA). - RESEARCH PROJECT ON CONFLICT RESOLUTION AND CONNECTING LINKS IN SOCIAL NETWORKS OF HISTORICAL EVENTS: AN APPROACH BASED ON COMPLEX NETWORKS, multidisciplinary network of complex networks, linked to the Latin American Institute of Advanced Studies, which includes researchers in Informatics, PPG in History and Physics, UFRGS, University of Sheffield and Coventry, UK, University of Jena, Germany, University of Bochum, Germany. - COOPERATION AGREEMENT DIALOGS BETWEEN THE HISTORY OF BRAZIL, LATIN AMERICA AND THE UNITED STATES, between the PPG in History and Brown University, in the United States. - participation of Prof. Gerhard Lubich, of the University of Bochum, Germany, in workshops and collaboration in research.

PPG Grade in the Quadrennial
Material Science 5

Background

PPG Grade in the Quadrennial
Mining, Metallurgy and Materials Engineering 7

Background
A very strong characteristic of the PPGE3M, since the beginning of its activities, is the integration with the productive sector of industry and services. In addition to forming different professionals for the market, there are many joint projects between public and private companies and the PPGE3M, mostly in the context of calls of national funding agencies and international exchange. Thus, PPGE3M is constantly aligned with the needs of technological development considering environmental, social and economic sustainability, which must meet all relevant legal and ethical aspects.

PPG Grade in the Quadrennial
Industrial Engineering 7

Background
In respect to this theme, the Ppgep develops researches on sustainable development, environmental sustainability and economic sustainability, through the systemic innovation. The collaborations involve institutions of Germany, England, Italy, the Netherlands and Portugal. The following is a brief description of the activities undertaken and in progress, which justifies the inclusion of PPGE3P in this theme. Recently, PPGE3P built a network of cooperation in research on the development and consumption of environmentally sustainable products, counting with the participation of Prof. Paolo Antonetti (England) and Marleen Onwezen (Netherlands). PPGE3P developed research in the area of Strategic Environmental Assessment, in partnership with the Graduate Program in Management and
Innovation of the Escuela Superiore Sant'Anna, Italia. The title of the research is "Knowledge for sustainability in public management ". The PPGEQ developed research in the area of Strategic Environmental Assessment, in partnership with the Graduate Program in Knowledge Engineering and Management of the UFSC and with the Environmental Sciences School of the University of East Anglia (England). Results include exchange of teachers and publications in journals. PPGEQ established a cooperation with the Business School of the Politecnico di Milano (Italy), by Prof. Antonio Dal Borgo, to conduct empirical research on the topic of sustainable innovation in the fashion industry involving comparative case studies in Brazil and Italy. The cooperation has already resulted in a joint publication in 2017. Prof. Carla ten Caten (PPGEQ) is responsible for the management of the cooperation agreement involving the UFRGS and the Faculty of Science and Technology (New University of Lisbon - UNL). The theme is systemic innovation as a promoter of sustainable development, comprising a method for sustainable innovation based on the product system service. PPGEQ participates of the Consortium EMS (European Manufacturing Survey), an international research network for research on technological innovation and organizational coordinated by the Fraunhofer Institute for Systems and Innovation Research (Germany). PPGEQ and the University of Southern Denmark (Denmark) have a partnership in research on innovation for sustainable development. The project studies sustainability indicators and industrial policies for the development of renewable energy systems.

PPG  Grade in the Quadrennial  
Chemical Engineering  6  

Background
The PPGEQ has been acting in the insertion and international cooperation in various ways. However, this is a point that still needs to be further explored. We highlight the organization of important events, participation in international committees and entities, obtaining awards of international prominence and in cooperation with universities abroad for research. Special attention is being given to the qualification of both students and professors, through stages of doctorate sandwich, post-doc and missions of short duration. In this theme, the PPGEQ has been conducting important research in the areas of (i) sustainable development: studies and developments of technologies for reducing impacts and climate changes, contributions to environmental sustainability, (ii) development of active and intelligent biodegradable packing from agro-industrial wastes and (iii) utilization of industrial waste to develop materials with added value. In the light of these aspects, the inclusion of PPGEQ in this theme is justified.

PPG  Grade in the Quadrennial  
Molecular and cellular biology  7  

Background
The Graduate Program in Cellular and Molecular Biology has research activities directly related to this theme. In particular, the use of agro-industrial wastes and by-products as a basis for generation of biotechnological products of importance; the search for genotypes and close species and species of cultivated plants which present phenotypic characteristics such as increased tolerance to low and high temperatures, as well as more efficient use of nutrients from the soil.

PPG  Grade in the Quadrennial  
Sociology  7  

Background
In this theme, there are two consolidated research groups, coordinated by permanent teachers of PPGs. The research group Technology, Environment and Society - TEMAS, group certified by CNPq, has been dedicated primarily to academic studies around the theme of sustainable development and environmental problems. TEMAS articulates four general topics of research: - the diversity and dynamics of the society-nature relations in social contexts of development; - the environmental conflicts that arise from the implementation of mega projects and joint ventures in civilan development; - the problem of new technical, technological innovations, its mediators and users and their impacts and controversies in contexts of development; - climate change, understood as environmental and socio-technical event, responsible for the emergence of constrictions and needs of political and instrumental reordering to establish new links between society and nature. Thus, the various projects developed within the group are aligned with the proposed theme. The research group Family Farming and Rural Development - GEPAD, certified by CNPq, brings together researchers interested in analyzing processes of rural development in a sustainable development perspective. Specifically in relation to this theme, the group develops international research project focused on the analysis of the "institutionalization of agroecologies" in Brazil, France and Argentina. The project is the result of a cooperative effort between Brazilian institutions (UFRGS, UFPA, EMBRAPA), French (CIRAD, INRA, University of Montpellier) and Argentina (INTA). The project examines how the various forms of agroecology are stabilized through various institutional support of public policies and the effects that these dynamics of institutionalization have on the agroecological practices.

PPG  Grade in the Quadrennial  
Zootechny  6  

Background
This theme has already produced 20% of theses (44/220) and 10% of the dissertations (60/603) of the program, as well as the development of 10 projects of interdisciplinary dimension with other PPGs of UFRGS and with international centers of excellence for research, development and innovation.
Background

Approximately 70% of teachers of the program has among its main lines of research issues related to climate change, extreme weather events, environmental vulnerability, etc. including work related to the techniques and methods of environmental assessment, the percentage of teachers' performance of PPGSR at this theme is even greater. Considering only the last two years, there were 50 dissertations and theses defended and nearly 100 articles published in journals in this theme, in the same period. Members of the PPGSR established partnerships in the context of this theme with the following countries: India, Russia, United States, Italy, Spain, Argentina, Canada and the United States, as well as multilateral collaborations.

Background

Historically, and sharply in recent years, the role of agriculture is essential for our country, being one of the strategic sectors for the growth of the economy and the social well-being. Studies assessing the diversity of pests and natural enemies in agroecosystems and adjacent natural systems have generated a series of information aimed at the sustainable management of crops. These studies have contributed to reducing the use of chemical inputs and resulting in social and economic sustainable environments. Researches are related to sustainable development, acting in the recovery and management of degraded areas, aiming at the restoration of environmental functions of environments altered by anthropic activities that compromise the use of the area, both for food production, as well as for the provision of environmental services. Economic aspects are studied, planning, management systems, alternatives of production systems, precision agriculture, physiology of production, genetic improvement, responses to stresses and weed control in systems for the production of grain-producing species. These studies are intended to increase the efficiency of using external inputs in agriculture producer of grains, increasing the productivity of crops and ensuring environmental, economic and social sustainable development of the agricultural productive system.

Many studies relate to the development of strategies that promote the sustainability of the productive system, by the adoption of soil conservation systems, with rotation and succession of cultures. In the area of genetic improvement and plant physiology, research seeks to understand the response of agricultural crops of importance to climate change today. Research in Horticulture have sought to understand how some horticultural crops in the southern region could adapt to climate change. Responses are obtained with adaptation of cultivars to areas that traditionally were not cultivated, with research into aspects of adaptation to different water regimes, thermal, solar radiation, relative humidity, and edaphic factors. The concern in relation to the environmental effects arising from agricultural activity has increased considerably. The research aimed at reducing the impact of agricultural activity and, at the same time, guarantee economic returns to the rural producers, diversity of agricultural ecosystems, food safety, and sustainability of agricultural activity.

Background

Considering the path that is already being traced, we intend to contemplate the actions in three topics of 17 Sustainable development objectives of Agenda 2030 of the UN, to develop innovative actions that will achieve a more egalitarian society. The work carried out by the research groups of the program fits in the 17 Sustainable Development Objectives of the UN Agenda 2030, specifically in the following topics: - Quality Education; - Action against global climate change; - Peace, Justice and effective institutions.
given to research (with foreign institutions) related to neocenozoico of Chile and Trinidad-Tobago. Complementing the study of diversity paleographic and paleoecological analyzes are being developed; (ii) research on climate change along the Quaternary, based on Foraminifera class fossils and isotopic analysis of carbon and oxygen, among other proxies. The data generated by these studies contribute for testing and calibrating the models created in the context of the Intergovernmental Panel on Climate Change (IPCC) program created in 1988, in the framework of the United Nations, on the initiative of the Program of the United Nations Environment Program (UNEP) and the World Meteorological Organization (WMO); (iii) analyzes in marine and estuarine biotic remains with applications to the interpretation paleoambiental and paleoclimatic; (iv) Currently, a project within the IODP/Capes program, in collaboration with FURG and UFSC, is being coordinated by LMC.

PPG | Grade in the Quadrennial
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Ecology | 6

**Background**

Within the scope of this macro theme, the PPG in Ecology develops several projects related to biodiversity and how their patterns and processes reflect on the environmental conditions, the characteristics of the landscape and the different types of land use, as well as on climate changes. These projects cover both surveys of unpublished data in the field (in several regions of Brazil, especially in the Mata Atlântica and Pampa Biomes, but also in the Pantanal and the Amazon), as well as projects in biogeographical scale, with data from field, museums and large databases, where a lot of information about biodiversity is available. The Graduate Program has developed and applied technologies for sampling and statistical analysis methods for fauna monitoring in extensive areas, such as in tropical forests, as well as for monitoring the dynamics of forests and fields in the southern region of Brazil with several permanent plots in environments preserved or under use with agriculture and livestock. The knowledge of the mechanisms of evolution of different species and the connection with the conservation is another research topic that fits in this theme. The genetic variation in space and time is fundamental to the evolution of the species, but the non-sustainable exploitation, as observed when the conversion of large expanses of areas of native vegetation for plantations of monocultures (e.g., soy, rice, pinus, eucalyptus) or the unbridled urban territorial ground (ex., on the coast of the dunes and the beach), has contributed to the loss of populations and species due to exposure of their habitats to complete destruction. Within this theme we have also focused on the development of automated systems for identification of species, such as, for example, through vocalizations of animals. Also in the context of this macro theme, there are projects comprising diagnoses of environmental impact using biomarkers of genotoxicity and toxicity, and teratogenesis, focusing on various environmental compartments (water and sediment in watersheds, soil and atmosphere) and trophic levels. Finally, we have a research area on ecological restoration of degraded areas, which covers this theme, especially considering the environmental, social and economic sustainability, including ethical and legal aspects.

PPG | Grade in the Quadrennial
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Education | 6

**Background**

The PPGEdu justifies its inclusion in this theme when it comes to the issue of diversities - ethnic, racial, cultural, gender and sexuality, and more recently, related to the growing movements of immigration due to contemporary conflicts and political issues in different countries of Latin America, for example.

PPG | Grade in the Quadrennial
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Language And Literature | 7

**Background**

This theme, which deals with environmental issues and sustainable development, has an interface, currently, with the areas of ecocritic and sociolinguistics, in studies focused on linguistic diversity, languages and indigenous textualidades. Currently, there are in PPG, ongoing guidelines for PhD programs and actions of extension with Minority Languages, Literatures and Cultures not hegemonic. It is understood that the sustainable development involves cultural and linguistic issues that are related to surveys of PPG in Language and Literature. Also concerning this theme, focusing on the theme of intermediadas, a teacher of the program was enrolled in post-doc, from 2015 to 2016, at the University of Miami, USA, which currently develops two research projects: "Biopics: Literature in Cinema through the historiographical metafiction" and "Construction of narrative suspense in literary texts and audiovisual works". In the context of Comparative Literature, we highlight the international event "Literature and sustainability," in the context of Comparative Literature and that resulted in the e-book Sustainability: What can do the Literature? [Http://www.unisc.br/pt/home/editora/e-books?id_livro=427](http://www.unisc.br/pt/home/editora/e-books?id_livro=427)

Currently we have a professor at post-doctoral level, and a PhD student in sandwich in Brown University, USA. There is an on-going proposal for translation and publication of the chapter "Paris", from the book Prosthesis (1995), professor and researcher David Wills, which explores the relationship between science and literature. The translation took place at UFRGS, in the context of undergraduate and post- graduate, the technical review was conducted in graduate and is in drafting a joint proposal of the publication of the chapter and texts of teachers of PPGLet UFRGS and the PPG in Language and Literature of UNICENTRO, PR. These activities are developed in the Group of Poetic Studies, from CNPQ. Prof. David Wills, who is also author of Dorsality (2008) and Inanimation (2017), should come to the course of language and literature of UFRGS, in 2019. Also in the interest of one of the themes. It is important to highlight the recent publication of the interdisciplinary nature of Space / Spaces. Studies of Comparative Literature (Porto Alegre: UFRGS, 2017), organized by several professors of the program, with the collaboration of professors.
from Lisbon, Portugal, Erlanger-Nürnberg, Germany, and professors of Brazilian universities: UFSC, UNISUL, UCS, UNICAMP, UNISC, UFPE and UFSM.

PPG Grade in the Quadrennial
Philosophy  5

Background
The PPGFIL wants to participate in this theme from their research projects that problematize the conditions from which nature can be taken as inexhaustible in ensuring an inexorable progress. Politics itself, in support of this project, had to surrender its place to the technique. The national states, as barriers to the free movement of goods, lose space in the proposition of regulatory policies. In this way, it is necessary to think on the anthropological and political aspects who allowed the current threat to the survival of humanity. In this sense, the three lines of the program problematize, under different aspects, the conditions under which nature and politics may, depending on the mode they are combined, assure or even threaten the permanence of the human species on Earth.

PPG Grade in the Quadrennial
Genetics and Molecular Biology  7

Background
The researchers A. Zolet, F. Bered, L.B. Freitas, M.P. Margis and T.R.O. Freitas have already established partnerships with several international centers. Collectively, the group operates in the assessment of biodiversity, in projects that aim to evolutionary understanding of species of plants and animals with special emphasis to the studies of genetic diversity, ecology and conservation. A. Zolet - partnerships established and consolidated with the Institute of Biosciences and BioResources, Division of Florence, National Research Council of Italy. Featured recently with a project in the Science without Borders/CAPES. F. Bered: partnerships with University of Vienna, Faculty of Life Sciences, Austria. With the James Cook University in Australia, the existing collaboration involves doctoral internships for students of PPGBM sandwich in the lab of researcher and the publication of articles. L. B. Freitas - a collaboration with the University of Bern, Switzerland, established through project for a visiting researcher of Science without Borders Program - CNPq, which resulted in the publication of several works in collaboration, a doctorate sandwich for student of PPGBM, and the adoption of a joint project funded by the National Science Foundation of Switzerland; with the University of Colorado Boulder, USA, the collaboration occurs through joint project funded by the National Science Foundation (USA) that allows the exchange of researchers with two visits of a post-doctoral student of Colorado and the trip of a researcher of PPGBM, all for a period of 30 days; with the Virginia Tech, USA, the partnership provides for the development of joint project, with funding from the CNPq/NSF and by conducting an internship of doctorate sandwich by a student of PPGBM, CAPES scholarship. M. P. Margis - the partnership with the Carnegie Institution/University of California, Stanford, was established through the Science without Borders Program - CAPES, which permitted the coming of this researcher to work in the lab and administer discipline in the PPGBM, which resulted in the publication of articles and exchange of students. T. R. O. Freitas - partnerships established with researchers from the University of Cambridge and Kent, UK, Universidad Nacional de Mar del Plata, Argentina, University of Berkeley - USA, Université de Grenoble, France, Center for Landscape Science - USA and Facultad de Medicina, UDELAR - Uruguay.

PPG Grade in the Quadrennial
Urban and Regional Planning  6

Background
In line 1, the thematic strategy on development in the regional context, with a political and economic approach, has been developed through stages of post-doctorate, cooperation in research projects and publications with groups of laboratory Géographie Cités and University of Paris 7 Denis Diderot. They have also carried out cooperation with the Universities Paris 1 Panthéon Sorbonne and Université de Reims Champagne-Ardenne. The Professor A. Rückert belong to the Scientific Council of the Collège International des Sciences du Territoire, Paris 1 University and University of Paris 7. He has participated to events with the presentation of papers; participation in the Editorial Board of journals L'Espace Politique of this university and Revue ends of the Institut Hautes Études d'Amérique Latin America of the Université Paris 3. Another professor maintains research with the Universidad Castilla-La Mancha (Spain). On "environmental, social and economic sustainability, including ethical and legal aspects," Prof. L. Piccinini develops research on urban morphology and low-income housing with the Sapienza University of Rome and actions of exchange and production of research and joint publications. In the perspective of sustainability, Prof. A. Kings investigates the relationship between the built environment and users' behavior, maintaining partnerships with the University of Duisburg-Essen and with MIT (Urban Studies and Planning). Also in the context of landscape and its relations of sustainability, Prof. D. Fialho plans a post-doctoral stay at the École des Hautes Études en Sciences Sociales. In the line of sustainability, the PROPUR maintains an agreement with the University of Duisburg-Essen, Germany. Still with Germany, we also have agreements for joint work with the TU Berlin. Prof. L. Miron held post-doctorate at the University of Huddersfield, UK and has also maintained relations of research with the University of Salford and University of Bath. In 2015, this led to the signature of a protocol of intentions UFRGS/University of Huddersfield through teachers L. Miron and P. Tzortzopoulos coordinator of Innovative Design Lab (IDL). Research in conjunction with the IDL has resulted in publications. In September of 2017 a workshop was held at CNPq between the University of Huddersfield and several Brazilian universities for the elaboration of an international center of...
research: Global Interdisciplinary Center for Innovation and New Product Development in Architecture and the Built Environment: UK - Brazil Collaboration.

PPG  Grade in the Quadrennial
Chemistry  7

Background
The PPGQ develops research and international cooperation in the context of new methodologies for the evaluation of the treatment of effluent discharge through advanced processes of photochemistry (with Spain). The researchers carry out studies in the area of organic microcontaminants monitoring in different real samples of environmental relevance. It is worth mentioning that the foreign researchers involved in this collaboration belong to the University Institute of pesticides and Waters (IUAPA), which aggregates the Laboratory of Analysis of pesticide residues (LARP) that in 2001 obtained the certificate of compliance with Good Laboratory Practice for the analysis of residues of plant protection products. PPGQ also develops research in the area of Environmental Chemistry in collaboration with Portugal (Aveiro) and Spain (Valencia). In the context of sustainable development, the PPGQ develops new strategies using biopolymers functionalized with ionic liquids and graphene for the preparation of bio-nanocomposites of high performance, contributing to the development of biocompatible materials and renewable energy innovators. Researchers from France are involved (Université Paul Sabatier Toulouse III and Université de Strasbourg), besides the University of Tel-Aviv. PPGQ also provides research on new catalysts in collaboration with the University of Lille. Yet in this context, we have developed research in Photocatalytic systems, production, and evaluation of photocatalysts as the basis of oxides of transition metals to work with clean energy production, approved in the Hansen Institute for Advanced Studies for international collaboration with Hanse-Wissenschaftskolleg, Germany. The PPGQ develops collaborative research covering the development of new approaches to catalytic pyrolysis of bench and larger companies, analytical methods for the study of bio-oil come from sustainable sources and the aqueous phase from pyrolysis, in collaboration with the American Environmental Agency, USA and with the Technical Research Center of Finland (VTT), Finland. Finally, the theme of sustainable development develops research on new polymeric materials through a Ph.D. Double Degree program with the Case Western Reserve University - CWRU. The PPGQ develops research projects with the Queen's University and the University of Victoria (Canada) for the development of new classes of biosensors, a relevant area given the large number of pesticides that are consumed in Brazil.

PPG  Grade in the Quadrennial
Resources and Environmental Sanitation  6

Background
All the research priorities of PPGRHSA (1º to 14º) fall in this topic: 1) Water in agriculture 2) Urban Water 3) Climate and resources 4) prevention, control, treatment and reuse of wastewater 5) treatment systems and water supply for human consumption 6) Natural Disasters hydrological 7) Coastal dynamics 8) Dynamics and modeling of aquatic ecosystems 9) Dynamics and modeling of aquifers 10º) Energy in water systems and alternative 11º) Solid Waste Management 12º) modeling and simulation physics and mathematics in hydraulics and hydrology 13º) Planning and management of water 14) Sediments in urban and rural areas.

PPG  Grade in the Quadrennial
Soil Science  6

Background
Based on the demands of the Brazilian society of the 80's, the Graduate Program has worked on the following research topics: Performance in the environmental area, especially in the themes of soil quality and contamination by industrial production, the inadequacy of the agricultural management, and the repercussion on water (soil erosion and trace nutrients). In more detail, we emphasize the studies on: (a) erosion in soils of Rio Grande do Sul, in conditions of natural rainfall and simulated rainfall; (b) the use of the soil as a means to discard and inactivate potentially polluting waste as compost, sludge treatment of liquid effluents, residues of leather processing industries, petrochemical industry; (c) the emission of greenhouse effect gases, both by sampling, with analytical infrastructure and field, as well as by computational modeling (simulation); d) the behavior of pesticides in soil and sediment deposition.

PPG  Grade in the Quadrennial
International Strategic Studies  4

Background
The area of concentration of PPGEEI is consistent with more than 15 years of research, advising, education and scientific production of professors of the program about the problems of socio-economic development, integration, regional policy and international security. Far from merely juxtaposing three central topics in the trajectory of countries and social groups outside the organic core of capitalism, it is a conscious and continuous effort to produce adequate explanations and descriptions of the challenges posed by the growth of the power and the relative wealth of the so-called Southern countries in the 21st century. With three lines of research that reflect the thematic cohesion of the Program and at the same time the specific competencies of the faculty, the areas of concentration of Development, Integration, and Security enable the education of professors and doctors specialized on the themes and the most dynamic regions of the contemporary world. Thus, the research at PPGEEI revolves around the issue of international
cooperation, and the problems related to security and development, both regional and global. In this context, Brazil's international insertion gets central.

Theme 2

Theme 2 – Integration of Basic Science, Information Technology, Engineering, Arts and Mathematics [STEAM]

PPG Grade in the Quadrennial
Administration 5

Background
Among the themes addressed in PPGA are those related to sustainable development in their various dimensions, innovation and competitiveness, and to the training of human resources at a high level, which is investigated in the context of societies and organizations. Thus, the program contributes to the formation of a high level of intellectual capital to engage professors and students in teaching, research and extension activities that are effectively aligned with the priorities lines PRINT, and with the demands of the country as a whole. In the last three years, the professors of PPG have developed international relations with 46 different international institutions, especially in countries such as the United States, France, and the United Kingdom. The main activities performed were international missions and research projects with the partner institutions, which resulted in joint publications and exchanges of students and teachers. It should be emphasized that more than 75% of teachers of the program have developed research projects in conjunction with institutions at international level in this period. More than 18 Ph.D. students have participated studied overseas through "sandwich" grants with these partner institutions. The majority of the international relationships developed over the last three years continue, with the development of new projects and negotiation of dual degrees. Also, new projects are being developed with universities in countries such as India, China, the United States and Norway.

PPG Grade in the Quadrennial
Materials science 5

Background
The Theme 2 coincides with the permanent lines developed by researchers at accredited graduate program in Materials Science.

PPG Grade in the Quadrennial
Design 5

Background
The Graduate Program in Design has a strong presence in this theme, with several studies, which resulted in theses, dissertations, and publications on the following topics: visual perception: design and technology applied to descriptive geometry; dimensional interactive interface in a software program for the teaching of descriptive geometry; E-books for children: visual design, interactivity and digital graphics capabilities; The transposition of aesthetic and symbolic requirements of project in formal attributes of the product.

PPG Grade in the Quadrennial
Chemical Engineering 6

Background
The PPGEQ has been acting in international cooperation in various ways, through the organization of scientific events, the participation in international committees and entities, the obtention of awards of international prominence and the collaboration with universities abroad for research. Special attention is being given to the qualification of both students and professors, through Ph.D. mobility, post-docs, and missions of short duration. On theme 2 (integration of Science, Technology, Engineering, Arts, and Mathematics), the PPGEQ has been conducting important research related to (i) modeling and simulation of reactive fluid dynamics and (ii) molecular modeling and simulation of fluid dynamics and processes and systems.

PPG Grade in the Quadrennial
Biological Science (neuroscience) 5

Background
The Graduate Program in Neuroscience has a strong presence in Theme 2. For example, the research group of Professor Elisa Calcagnotto has ties with the UCSF (University of California, San Francisco). She has already planned to receive the visit of a collaborating professor of the USA in March 2018 and to send him a Ph.D. in mobility later this year. This research group is studying the mechanisms of refractory epilepsies and means of treatments. Another research topic relevant is the use of mathematical tools for electrophysiological analysis, in collaboration with the Institute of Physics of UFRGS. Prof. Marco Idiart and one Ph.D. student under his supervision have been recently awarded financial support to carry out an internship at Stony Brook University, New York, from June to August 2018, to work on a model of neural networks. The title of the project is "Computational simulation of the olfactory preference for maternal odor from neuroethology to TOCOPHERYL". Concerning the integration with Arts, Professor Carmen
Gottfried recently published a scientific book entitled "What we have in our head", to popularize neuroscience, targeted towards students at primary education level. This book is part of an extension project called "Science and Art".

**PPG Grade in the Quadrennial**

**Physics 7**

**Background**

The PPGFis stands out for its research in the study of water, a natural resource of fundamental importance. Cleaning and treatment of water require the development of cutting-edge technologies, strongly based on microscopic models. The PPGFis, through the group of Prof. Marcia Barbosa, is at the forefront of this field. The Physics of materials is one of its strong points, developing advanced materials with new properties, indispensable for the advancement of integrated science. In biological physics, the PPGFis studies networks theory and simulation for data analysis of large-scale data on gene expression. It collaborates with the Institute of Childhood Cancer (ICI) on the determination of the metabolic differences presented by Ewing Sarcoma metastases when compared to less advanced versions.

The technique is used for the study of several types of cancer of the mouth and diseases of genetic origin as the polycystic kidney disease. PPFis collaborates with the Graduate Program in Genetics, to analyze data from gene expression of soybean and rice.

The PPGFis also develops simulation techniques of active substances. Many living organisms are endowed with the ability to migrate and reorganize themselves, which is necessary for the development but is also associated with certain diseases (such as cancer metastasis). The interest is to investigate the possible behaviors of systems formed by many live agents, which requires the formulation of models that explicitly take the migration activity, as well as the death and proliferation of these agents. Applications range from the development of the embryo to the investigation of how metastases cells form and invade other tissues, or how cells of the immune system are capable of an inflammatory response. In the area of magnetic and superconducting materials, PPGFis studies materials for the generation, the transport, and the storage of energy. We have current research and mutual interest in developing research with the University of Grenoble and the Technical University of Denmark (DTU). With Grenoble, we intend to undertake projects in the area of magnetism, while studies on high-temperature, critical superconductors would be the object of collaboration with the DTU. Finally, the PPGFis investigates the manufacture of innovative devices, sensors, integrated circuits in silicon and inorganic and organic semiconductors, new devices for hydrolysis of water, software for data analysis of gene expression on a large scale.

**PPG Grade in the Quadrennial**

**Psychology 7**

**Background**

On Theme 2, The Graduate Program in Psychology can contribute with: 1) Assessment and measures in Psychology (projects that aim to develop, adapt and produce evidence of validity and reliability of assessment tools in psychology and related areas); 2) Human Development (Research on the processes involved in the changes and stabilities (cognitive, emotional, social, behavioral) in psychological and psychiatric disorders, neurological and physical health conditions; 3) Health, Prevention and Intervention (development of psychotherapeutic modalities of treatment and community interventions and social); and 4) Cognitive and Behavioral Neuroscience (translational research of prevention, treatment, and Rehabilitation with instruments of psychophysiology and neuroimaging, electroencephalography, in combination with behavioral tasks and psychological instruments).

**PPG Grade in the Quadrennial**

**Microelectronics 5**

**Background**

The Graduate Program in Microelectronics is the only multidisciplinary program of Brazil focused on technologies for micro- and nano-electronics. This program was created through the collaboration of four UFRGS Institutes: The Institutes of Computer Science, Physics and Chemistry, together with the Department of Electrical Engineering. It has strong collaboration high-level human resources of the electronics and information technology. The program promotes the technological advancement in the most diverse technological aspects of nano-electronics from the conception of integrated circuits, the development of CAD tools to support the design and verification of circuits and nanoscale devices, and the behavior of hardware components under exposure to radiation. The studied areas encompass not only the microelectronics itself (which aggregates knowledge, methods and techniques from engineering, informatics, materials science, physics and chemistry) but also its practical applications in day-to-day life. For example, PGMICRO has been working on the manufacture of innovative devices, sensors, integrated circuits in silicon and other inorganic and organic semiconductors. The techniques developed in the PGMICRO for the developments of circuits with greater efficiency are essential for the maintenance and development of supercomputers and data centers of the future, which in turn are fundamental for the expansion and maintenance of services of means of communication. As an example, the technology developed by PGMICRO helps provide ways of treating and compress (with advanced techniques of DSP running on hardware) the multimedia content (such as digital TV, IP video, music, etc.) with higher quality and lower cost.

**PPG Grade in the Quadrennial**

**Geosciences 7**
Background
The Graduate Program in Geosciences has four areas of research: Geochemistry, Paleontology, Marine Geology, and stratigraphy. In Geology, most researchers develop their work outside of Brazil, for instance in Argentina, Uruguay, Chile, in international ocean areas, in the United States, in Norway, in Antarctica, in Central Africa, and in Australia. In addition to the international cooperation necessary for the performance of the PPGGEO researchers, the program has a strong potential for interaction and collaboration with various programs and lines of research of the UFRGS. We highlight the operations with the following other programs: Graduate Program in Geography, Graduate Program in Remote Sensing, Graduate Program in Strategy and International Relations, Graduate Program in Physics, Graduate Program in Chemistry, Graduate Program in Materials Sciences, Graduate Program in Animal Biology, Graduate Program in Cell and Molecular Biology, Graduate Program in Molecular Genetics, Graduate Program in Applied Mathematics, Graduate Program in Water and Environmental Sanitation.

PPG Grade in the Qua dernnial
Computers in Education 7

Background
The PGIE develops research in areas such as Informatics, Education, Psychology, among others, enabling teaching professionals to interact with new technologies in their work environments. In particular, we highlight research in the area of recommendation systems, educational games, mobile learning, and in virtual laboratories using immersive worlds aimed to support education in science and mathematics. Arguably, the central aspect of the program is directly related to the integration of new technologies for the future work of educators and, consequently, is connected indirectly with the future of the work of all professionals whose training pass through a process of formal or informal education. PGIE hosts bilateral and multilateral research partnerships: (a) CAPES/Cofecub with France (two projects, one related to mobile learning and the other to Artificial Intelligence and intelligent tutors); (b) PRO-AFRICA/CNPQ/MCT (two projects in Mozambique and Angola, focused on education and training in health, respectively); (c) prosul/MCT/CNPq that supports cooperation in science, technology and innovation (C&T&I) between groups in Brazil and South American countries, with a view to improving the quality of life of citizens; (d) CAPES/Grices, between Brazil and Portugal, with the aim to stimulate the exchange and training of teachers and researchers Brazilians and Portuguese; (e) STC-AmSud, initiated in 2011, involves France, Chile and Brazil, on the theme of ubiquitous learning research; (f) PROJECT ROA-MOBRAS: Repository of Learning Objects Mozambique-Brazil.

The specific partners identified on the Theme 2 would be the University of Coimbra, Universidad Carlos III (Madrid), and the Laboratoire de Didactique André Revuz (Paris, France).

PPG Grade in the Qua dernnial
Language and Literature 7

Background
The Theme 2 contemplates the ongoing activities of PPGLet, which are related to the collaboration with foreign Institutes of Sciences of computing and information to develop products and terminologies, in the area of language studies, and research on trans- and inter-medium related to the dialog between the literature/arts and other media. The overall field of studies is the literature on interfaces visual, audio and digital. On the theme of inter-media, one of our Professors has spent 1 year of research leave, from 2015 to 2016 at the University of Miami, USA, with which she currently develops two research projects: "Biopics: Literature in Cinema through the HISTORIOGRAPHICAL metafiction" and "Construction of narrative suspense in literary texts and audiovisual works". In Comparative Literature, we highlight the international event "Literature and sustainability," that resulted in an e-book entitled "Sustainability: What can the Literature?" (Http://www.unisc.br/pt/home/editora/e-books?id_livro=427).

PPGLet also has a professor in research leave, together with a Ph.D. doctoral student in mobility at the Brown University, USA.

There is an on-going proposal for translation and publication of the chapter "Paris", from the book Prosthesis (1995), by professor and researcher David Wills, which explores the relationship between science and literature. The translation took place at UFRGS in the research group "Poetic studies". Prof. David Wills, who is also the author of Dorsality (2008) and Inanimation (2017), should come to UFRGS, in 2019. Finally, it is important to highlight the recent publication of "the interdisciplinary nature of Space/Spaces," organized by several teachers in the program, with the collaboration of professors from Lisbon, Portugal, and Erlangen-Nürnberg, Germany.

PPG Grade in the Qua dernnial
Electrical Engineering 6

Background
This theme falls into two areas of interest of PPGEE: (i) Engineering Computing and (ii) Control and Automation. The activities in these areas are concentrated on the following topics:
- Modeling (physics and mathematics) of complex systems (Cyber-Physical Systems) and the development of control algorithms and methodologies for such systems.
- micro and nano-electronics studies of complex computing systems from the atomic level up to the algorithmic level, passing through its implementation in circuits micro and nano-electronics in semiconductors and new nano-materials.
- Development and applications in Signal Processing.
- Development of networks and industrial communication protocols as well as devices for optical communications.

PPG Grade in the Quadrennial
Applied Mathematics

Background
The Program has related research on:
(i) the study of nuclear technology and its range of applications, including nuclear safety and nuclear non-proliferation;
(ii) the study of harmonic analysis and its applications;
(iii) the study of graph theory and its applications.

With regard to the first topic (i), there is a collaboration between UFRGS and North Carolina State University. In addition to the current applications in the nuclear non-proliferation treaty in which our groups are involved, we will explore the implementation of our new methods for the inspection of nuclear fuel burned in dry storage to verify its integrity. The applications in mechanical and medical fields have also been explored through collaboration with other groups.

On the topic of harmonic analysis (ii), this is an area of mathematics that has been studied intensively at IMPA and PPGMAp-UFRGS. Our research has involved and will continue involving theoretical aspects of eminently Real harmonic analysis, such as the study of continuity and regularity of fractional integral operators, natural and hypersingular, the study of variants multilinear quadratic functions in matters involving the existence of extremizantes and precise dimensions to inequalities of operators in Lebesgue spaces with weights. Also, we work on applications that have recently impacted applied sciences, in particular, the processing of digital signals. We aim at collaborations with Germany, Finland, and the United States, on the lines of research of restriction of the Fourier transform, regularity of Extremal Maximum functions and problems.

(iii) In the area of graph theory and its applications, we work on the spectral theory of graphs, which has been used in the solution of problems in several areas of knowledge, with applications in chemistry, Combinatorial Optimization, and Computer Science.

Another line of research involves the study of probabilistic tools and regularity for the study of graphs of large dimensions, which has applications to a series of current problems, which are typically treated with the name of Big Data. Finally, there is research in evolutionary game theory, which is an important tool in various scientific areas, such as physics, biology, Economics, and Sociology.

PPG Grade in the Quadrennial
Computation

Background
The activities related to Theme 2 in Computing include:
- A project submitted by Prof. Ana Bazzan to the SEBRAE Foundation entitled "Women, Conflict and Peace: Gendered Networks in Early Medieval Narratives", a project on the analysis of historical events via network theory; isolated project on analysis of fiction and dramaturgy via network theory. It has already obtained preliminary results on: i) the conflict Holy Roman Empire-GERMANIC in the 13th century; ii) the temporal analysis of social networks of literary pieces.
- Research project with potential for collaboration with Univ. of Sheffield, Univ. of Coventry, and Univ. of Jena.
- A collaboration established (2002-2022) with researchers from the City, University of London, conducted by Prof. Luis Lamb, and translated in the form of articles and books together (more than 30 joint publications, more than 10 events co-organized).
- Surveys conducted in the areas of Artificial Intelligence, Machine Learning and Reasoning, aiming at modeling of complex problems.

PPG Grade in the Quadrennial
Epidemiology

Background
The Graduate Program in Epidemiology accounts with approximately 30 teachers originated from different areas (medicine, dentistry, pharmacy, speech, nutrition, statistical and Anthropology). Over 300 students have graduated in Epidemiology, with fast access to the job market (in the Academy or the health system). Its ten topics of research cover areas of global importance, focusing on national and international collaborative projects, with many large companies. In the last decade, it has attracted foreign students as regular students (from Uruguay, Angola, Ecuador, Colombia) or for the realization of internships of research (from the United States and England).
In terms of large-scale project, the ELSA-Brazil initiative (Longitudinal Study of Adult Health) has triggered a partnership with the University of Cambridge via Interconnect, a project for the completion of meta-analysis with individual data on nutrition, diabetes, and obesity. The mechanism of work is innovative and does not require the sending of individual data of participants to the pool.

PPG Grade in the Quadrennial
Background
Regarding the theme 2, several actions previously undertaken involve the research field of biomechanics of dancing. Among the actions that exist in Graduate Program of Human Movement Sciences, we find the formation of the network Brasil/United Kingdom in 2016. It included the international exchange of teachers/researchers a proposal entitled: “The potentialities and challenges of research in Medicine and Science of Dance: building innovative collaborations between the United Kingdom and the United States.” The proposal aims to present an overview of the current state of the field of medicine and science of Dance (MCD), addressing questions such as: what is MCD? How has the MCD dealt with the health of dancers in the Brazil/United Kingdom? And what are the challenges of MCD in both countries? Through lectures, workshops for research and exchanges, visits to recreational and cultural activities, the participants will acquire an overview of the research and funding opportunities available in the United Kingdom/Brazil, also becoming aware of career development opportunities and how to form international collaborations. This project has the potential to create a positive impact in different leading researchers in dance, which still have little knowledge about this neglected field of study. Subsequently, these researchers would be able to initiate innovative collaborations that may lead to the development of services, research, and educational opportunities, for both the dancers and the professionals involved with the dance. Members: Prof. Aline Nogueira Haas (UFRGS), Prof. Adriano Principe Bittar (UEG), Prof. Rimal Picon (USP), Prof. Matthew Wyon (University of Wolverhampton), Prof. Yiannis Koutedakis (University of Wolverhampton, UK).

PPG Grade in the Quadrennial Resources and Environmental Sanitation 6

Background
All the research topics of PPGRHSA foster the integration of the fields of Theme 2, especially between basic science, information technology, and engineering, namely: (1) Water in agriculture 2) Urban Water 3) Climate and resources 4) prevention, control, treatment and reuse of wastewater 5º) treatment systems and water supply for human consumption 6) Natural Disasters hydrological 7º) coastal dynamics 8) Dynamics and modeling of aquatic ecosystems 9) Dynamics and modeling of aquifers 10º) Energy in water systems and alternative 11º) Solid Waste Management 12º) modeling and simulation physics and mathematics in hydraulics and hydrology 13º) planning and management of water 14) Sediments in urban and rural areas.

PPG Grade in the Quadrennial Medical Sciences: Endocrinology 6

Background
The two areas of concentration of PPGENDO are comprehensive. The projects focus on relevant issues in the fields of health sciences as clinical problems, Phytopathogenic, diagnostic methodology and basic research. In addition to the clinical and epidemiological studies, we also use approaches in biochemistry, applied molecular genetics, transnational medicine and meta-analysis. This enables the Program to extend and deepen new scientific questions in the pathogenesis of diseases, and its different mechanisms and therapeutic options.

In the last decade, the translational medicine was quite evident in our publications. Beyond our known tradition of Clinical Medicine of excellent quality, we observed a significant interaction between these areas. In the last year we started collaborations with teachers from Informatics Institute of UFRGS. More specifically, the research group of Professor Daisy Crispim Moreira has conducted studies involving bioinformatics in collaboration with the Professor Mariana Recamonde-Mendonza. The first study resulting from this collaboration was recently published (Endocr Connect. Nov 2017;6(8):773-790) and three more are in the process of submission for publication. Another interaction with the Institute of Informatics was held by Professor Luciana Verçoza Berry with the aim of using tools of Data Science (Big Data And Machine Learning) in clinical studies.

PPG Grade in the Quadrennial Visual Arts 5

Background
In theme 2, the Graduate Program in Arts can contribute in at least two aspects. Art and Technology is a consolidated field of research and construction of knowledge, in which creative processes and technology are inseparable. In addition, the visual arts promote the construction of visuality and the diffusion of scientific thought. Through their specific methodologies, the visual arts participate directly in the grammar of the communication of science and technology in its experimental dimension.

PPG Grade in the Quadrennial Music 7

Background
The Research Group in Interpretative Practices (GPPI) of Graduate Program in Music aims to consolidate an area of studies and research in interpretative practices that explain the legitimacy of musical performance at the University as a field of knowledge open to the deepening of discussions, reflections, and scientific work. In this sense, concerning the Theme 2, the interaction with researchers from the Institute of Mathematics of the UFRGS allowed an exploratory investigation of the potentiality of mathematical analysis tools to model the processes of public performance, in terms...
of temporal micro-variations and expression. The professors of PPG-Music have supervised theses at UFRGS's Institute of Human Movement (Doctorate) and Institute of Informatics (Masters). Besides, several phonographic records of a number of CDs published by the Program use computerized techniques. Finally, the Program de Maestría y Ph.D. in Music from the Autonomous University of Mexico (UNAM) involves the participation of advisors of the PPG-Music.

**PPG Grade in the Quadrennial**

**Biological Sciences (Physiology)**

- 5

**Background**

Prof. Patricia Pranke's research group is working on a predictive model, using software developed by her group, for the prediction of the best combinations of solvents and polymers for the development of biomaterials and products used for the release of drugs and other bioactive molecules for tissue engineering. It also uses tests performed in vitro and in vivo on an animal model.

**PPG Grade in the Quadrennial**

**Chemistry**

- 7

**Background**

On Theme 2, the Graduate Program in Chemistry (PPGQ) works on the development of polymeric materials using nanoparticles, and chemically modified nanoparticles (for application as engineering plastics as automotive, construction, aerospace, etc.), through a double degree program with the Case Western Reserve University, via an agreement with CAPES. The PPGQ also develops basic research in the field of liquid crystals to implementation in optics, photonics and new soft materials in collaboration with the University of Hull, UK and the University of Colorado, Boulder, USA. The PPGQ develops collaborative research with the University of Nebraska, USA, for the development of new software for the treatment of two-dimensional data of GCxGC/MS for application in demands of the food and beverage industry regarding the obtention of fingerprints and biomarkers of products and processes combining basic science and their application. With the University of Waterloo in Canada, PPGQ develops research on the development of new technologies in the area of instrumentation for GCxGC, especially cheapest modulators, bringing many benefits for the development of GCxGC. The PPGQ also presents scientific cooperation with the Institute of Macromolecular Chemistry of Prague for the development of technology to perform experiments of X-ray scattering large equipment using application of electric field and for the development of self-organized colloidal systems. In addition, the PPGQ develops research in cooperation with the CNR-Italy that addresses multiple strategies to advance the state of the art in the areas of tissue engineering and medicine. PPGQ has scientific cooperation with The State University of New Jersey, Rutgers, USA, for the development of new biomaterials, producing nanofibers and 3D printing of biomaterials. There is scientific cooperation with the University of Bielefeld, researching the development of thermosensible micro-gels from natural polymers with application in the area of health. There is a collaboration with the Queen's University and the University of Victoria (Canada), on research related to the obtaining of new classes of biosensors. The PPGQ also features in Medicinal Chemistry collaboration with the Universidad Nacional del Sur, Argentina for the development of bioactive molecules for the treatment of Alzheimer's disease.

**Theme 3**

**Theme 3 – Impact, development, access to and insertion of new technologies, artificial intelligence, information technology and robotics in the future of work**

**PPG Grade in the Quadrennial**

**Computers in Education**

- 7

**Background**

The program fosters research and continued production of innovative knowledge in areas such as Informatics, Education, Psychology, among others, enabling teaching professionals to interact with new technologies in their work environments. In particular it is worth mentioning investigations in the area of recommendation systems, educational games, mobile learning, virtual laboratories using immersive worlds aimed to support education in science and mathematics. It can be argued that the central aspect of the program (Computers in Education) is directly related to the integration of new technologies for the future work of educators and, consequently, is related indirectly with the future of the work of all professionals whose training pass through a process of formal or informal education. The program supports bilateral and multilateral programs of existing research: (a) CAPES/Cofecub (two projects, one related to mobile learning and other Artificial Intelligence and intelligent tutors); (b) the PRO-AFRICA/CNPQ/MCT (two projects in Mozambique and Angola, focused on education and training in health, respectively); (c) the prosul/MCT/CNPq that supports cooperation in science, technology and innovation (C&T&I) between groups in Brazil and South American countries, with a view to improving the quality of life of citizens; (d) the CAPES/Grices, between Brazil and Portugal, with the aim to stimulate the exchange and training of teachers and researchers Brazilians and Portuguese; (e) the STC-AmSud, initiated in 2011, involves France, Chile and Brazil, pointing to the research topic Learning Ubiquitous; (f) Nationwide, the program for cooperation in research with a group of the Uneb (support of Cnpq/Finep); (g) The cooperation University-Company (Conexum), support of CNPq/MCT, the (h) PROJECT ROAMOBRAS: Repository of Learning Objects Mozambique-Brazil on this line the PPGIE AGGREGATOR identifies
international partnerships with the University of Central Florida (USA), University of Minho (Portugal), Unlp - Plata-Argentina, University of London (England), University of Calgary (Canada), University Mount Royal (Canada)- University of Paris 1 (Sorbonne, France), University of Aveiro, Instituto de Telecomunicações de Paris, UAB Portugal, National University of Colombia - Medellin, University of Montréal (Canada), Universidad Autònoma de Barcelona (Spain).

PPG  Grade in the Quadrennial
Dentistry       6

Background
The Graduate Program in Dentistry, UFRGS, in its more than 25 years of existence has always aimed at the formation of qualified human resources for teaching and research, assuming a leadership position in the southern region of the country as trainer center of excellence, having received grade 6 in the last CAPES assessment program. The program prioritizes internationalization, both from the point of view of academic mobility of faculty members and students and by receiving of faculty and students from abroad. As regards the proposed themes for the PRINT call, the program has a line of research on biomaterials and Therapeutic Techniques in Dentistry, which is concerned with the development of new technologies in health, both in the context of prevention and treatment of different oral health problems (in line with the development and integration of new technologies). This also includes the development of new materials, with licensing of patents as a priority, from both domestic products and innovation with universal raw material. The primary mission of the graduate program in dentistry is the formation of high level human resources. Internationalization is, in this sense, a fundamental pillar for the consolidation of excellence goals of the program. The participation in the PRINT call is of extreme importance to achieve these goals.

PPG  Grade in the Quadrennial
Remote sensing  4

Background
For issues related to robotics, there is the close contact between faculty from the program and the Graduate Program in Computing at UFRGS (PPGC), in particular the Phi Robotics Group. For questions related to the environment, there is great interaction with professors in the Graduate Program in geography and the Graduate Program in Geosciences. Some of the faculty members are also part of these other programs. Research related to free hardware and also GNSS reflectometry happens in great interaction with the Institute of Physics, in particular with Prof. Rafael Pezzi, coordinator of the Center for Academic Technology at UFRGS. There is strong interaction with international groups through the RAS-SIGHT (Robotic and Automation Society - Special Interest Group on Humanitarian Technology) of the IEEE, with some work resulting from these events. There have been two technical visits, two lectures given, and several working meetings. With respect to multilateral collaborations, we highlight the research group on GNSS reflectometry, which is part of the International Association of Geodesy, coordinated by a faculty member. This working group is composed of approximately 20 members from over 10 countries (Sweden, France, Spain, Japan, USA, Germany, Switzerland, Luxembourg, France and the United Kingdom). One of the results of this group is a number of joint publications with the University of Luxembourg and with the National Oceanography Center in Liverpool in the UK.

PPG  Grade in the Quadrennial
Design         5

Background
The Graduate Program in Design has a strong presence in this theme, highlighting the development of several studies, which resulted in theses, dissertations and publications in the following themes: parametric Design from 3D scanning of geometries of nature with the growth pattern of spiral; laser Machining of 3D models by means of recording multiple layers on post-objective galvanometric machines! Automating the trace of female basic molds by means of parametric modeling software; Study of the application of interactive technologies for mass customization in the automotive industry.

PPG  Grade in the Quadrennial
Education      6

Background
The accessibility extends from the definition of public policies to even simpler features - physical media, information and communication - that aim to human education. It is relates therefore, with the possibility of accessing, permanence and ownership of school knowledge at its different levels and stages. The theme is constitutive of the actions of the graduate program in education - as, for example, the affirmative policies for admission in the Master's and Doctoral Degrees of black people, quilombolas, in a situation of disability, indigenous populations, transvestites and transsexuals - and the researches carried out by us through the different lines that they occupy, for example, of special education and inclusive processes of deaf culture and assistive technologies.

PPG  Grade in the Quadrennial
Industrial Engineering  7

Background
This theme, the program develops researches in international collaboration on the themes (i) impact of new
technologies on relations between suppliers, (ii) the impact of new technologies on employment, under the ergonomic
perspective, (iii) the development of new technologies and methods for quality control and reliability, and (iv) analysis
of opportunities and risks arising from the introduction of new technologies in complex socio-technical systems. The
collaborations involve institutions in South Africa, Australia, Belgium, Denmark, the United States, Italy, France and
England. The following is a brief description of the activities undertaken and in progress, justifying the inclusion of the
program in this theme. The program develops a project entitled "Digital collaborative design involving suppliers: 
limitations and contributions of ICT" in partnership with the Institut Polytechnique de Grenoble. In the context of this
project, the program began a partnership with the Industrial Performance Center (IPC) at the Massachusetts Institute
of Technology (MIT), which will examine the impacts of digital technologies in emerging markets like Brazil. The
program maintains a long cooperation with the UNITE HYGIENE et Physiologie du travail of the Université Catholique
de Louvain (Belgium). The program is consolidating actions of exchanges between the UFRGS and the Université
Paris-Est Créteil (France). The program keeps exchanges with Rutgers University in the area of Quality Engineering
(optimization of products and processes, quality control and reliability), resulting in software development, mathematical
techniques and joint publications. The program collaborates with the Digital Osservatori Innovation of the Politecnico
di Milano (Italy) in research on innovative capacity mediated by information technologies and application of emerging
technologies for innovation in business models. At the end of 2017, the program began a research collaboration with the
Università di Bologna (Italy), marked by the visit of Prof. Cristina Boari to UFRGS. The program conducts research on heuristics to task scheduling (sequencing) in conjunction with the University of Massachusetts at Boston, USA. The program has been developing projects with Griffith University, Australia, Macquarie University, Australia, University of Florida, Sapienza Università di Roma and University of Southern Denmark in the area of resilience engineering and management of safety in complex systems.

PPG  Grade in the Quadrennial
Mechanical Engineering  6

Background
In the context of research Theme number 3, which involves impact studies, development and integration of new
technologies, artificial intelligence, information technologies and robotics in the future of work, the faculty and students
of graduate program in Mechanial Engineering (PROMEC) can act mainly on issues involving Robotics, because
there are several researchers of the program acting on this topic. This is an issue of great importance, at a time that
gradually a growing number of tasks shall be performed by robots. Thus justifies the association of the program with
this research theme.

PPG  Grade in the Quadrennial
Water Resources and environmental sanitation  6

Background
New technologies are under being investigates in this theme. In the program's line of research on"Modeling and
simulation physics and mathematics in hydraulics and hydrology" are developed several different mathematical
models, which have led to technology transfer and patent filing.

PPG  Grade in the Quadrennial
Chemistry  7

Background
In this theme, the faculty program conduct research on the insertion of new technologies, through international
collaboration established 2013. This collaboration is aimed at the study of the mechanisms of photofragmentation,
new polymeric resins using Extreme Ultraviolet (EUV, ~13.5 nm). These in turn, in conjunction with the EUV
Radiation, will be used by the semiconductor industry to produce a new generation of integrated circuits with
resolutions below 10 nm (EUV lithography). This project has the collaboration of the Indian Institute of Technology,
Mandi; the program collaborates on synthesis of polymeric resins and the Center for Optoelectronics and Optical
Communications - UNC Charlotte, USA (EUVL Lithography). The Photochemical studies are developed at the
National Synchrotron Light Laboratory, LNLs, Campinas, SP, through the projects: SGM-15128 (2013), SGM-16222
(2014), SGM - 18822 (2015) and 20160054 (2016). Still in this research line, we mention the collaborative research
with The State University of New Jersey, Rutgers, United States for the development of new biomaterials. In this area
of biomaterials, development of new technologies, including techniques for producing nanofibers and 3D printing of
biomaterials, bring technological development in this area and promising prospects for this new technology in the
country. As mentioned in the previous item, the development of new technologies applied to characterization and the
study of new materials, currently held in cooperation with the Institute of Macromolecular Chemistry of Prague.

PPG  Grade in the Quadrennial
Chemical Engineering  6

Background
The graduate program in Chemical Engineering has been acting on international cooperation in various ways.
However, this is a point that still needs to be further explored. It is the organization of important events, participation in
international committees and associations, obtaining awards of international prominence and in cooperation with
universities abroad for research. Special attention is being given to the qualification of both students when faculty
members, through doctorate sandwich internships, post-doctorate and research missions of short duration. In theme 3, the program has been conducting important research in the area of (i) the development and integration of new technologies in the chemical industry, (ii) Development of membranes and processes for the separation, concentration and purification of compounds in the most diverse sectors of industry and (iii) Development of new polymers and biomaterials. In the light of these aspects, this justifies the program association with this research theme.

PPG Grade in the Quadrennial
Performing Arts 4

Background
Under this theme the program highlights the collaboration with the Center for Dance Research (C-DaRe)/Coventry University, in which develop around 20 research projects in the area of the dance floor, gathering researchers from the UK and other European countries. C-DaRE are also hosts and supports three academic journals: Journal of Dance and Somatic Practices, Journal of Dance, Movement and Spiritualities, Journal of Screendance. Such cooperation was initiated by Prof. Monica Dantas, with the realization of scientific mission of short and a postdoctoral fellowship from Capes, between September 2015 and March 2016, with the project "Digital Files in dance: tools for documentation, record, creation and dissemination of Repertoires coreográficos", with supervision of Prof. Dr. Sarah Whatley, which resulted in the following actions: (a) presentation of research in international events as Digital Echoes 2016 (Coventry University) and Dance Fields Conference 2018 (University of roehampton); (b) technical visits carried out by Professor Monica Dantas to National Resource Center for Dance/ University of Surrey and the Trinity Laban Conservatoire of Music and Dance; c) visit of Dr. Hetty Blades (Coventry University) to the program in May 2018, for the development of research on new forms of documentation and dissemination of thought in dance and participation in the discipline Advanced Seminar in Scenic Arts; (d) the participation of Professor Victora Thomas (C-DaRE) in qualifying examination of doctoral submitted by Andrea Moraes Soares; (d) completion of phd-students sandwich Andrea Moraes Soares (2017/2) in C-DaRE; e) scientific mission of Professor Dr. Sarah Whatley, coordinator of the C-DaRE, along the UFRGS, in March 2018, a joint action between the program, the Sciences of Human Movement graduate program and the undergraduate course in Dance, funded by the British Council; f) Publication of article of the faculty (Dantas; Silva, 2014) in the Journal of Dance and Somatic Practices and publication in the Journal Scene of article of Dr. Emma Mehan, from C-DaRE. In summary, we highlight academic exchanges carried out by means of post-doctoral project and scientific visits funded by Capes and by the British Council aiming at the creation, registration, documentation and memory of the performing arts, which could serve as tools for the creation and recreation of artistic productions of the XX and XXI centuries.

PPG Grade in the Quadrennial
Physics 7

Background
The program has a strong presence in advanced materials. The development of new materials with new properties, are essential for the advancement of various areas of science, including artificial intelligence and robotics. The graduate program in physics plays a key role in the development of projects implemented in the area of microelectronics (photo sensors, smoke detectors and X-ray particles), as well as in the development of spin devices and applications.

PPG Grade in the Quadrennial
Microelectronics 5

Background
Because of the reduction in the size of the CMOS (Complementary Metal-Oxide Semiconductor) transistors, mobile devices currently need greater computational capacity, density of components and increase in power dissipation per chip area. The increasing computing capacity of mobile devices is explored in large proportion for multimedia applications. However, the processing of images and videos has an intense computational demand resulting in some bottlenecks such as: (a) energy consumption for battery-powered devices (b) Aging of MOS transistors. In this way, the design of VLSI systems (Very Large Scale Integration) for portable digital devices should consider different policies to control efficiency and on the effects degrading due to the aging of MOS transistors. Among the different multimedia applications, the encoding of video has a growing interest in both the scientific community and industry. Research is conducted in approximate computing, where applications can tolerate some loss in the quality of information, producing acceptable results, in favor of a efficient circuit design in terms of energy consumption. The key idea of research is to insert efficient approaches in energy consumption which may cause logic errors controlled but that reduce the system's critical path and consequently the errors of violation of delay caused by aging. There is a worldwide trend in the use of tolerant chips to make the robust systems for critical applications. Applications in robotics, autonomous cars, medical-hospital, or aero-space cannot fail due to the high risk involved. Are carried out research on new devices to be applied in the area of robotics and intelligent vehicles like sensors, smoke particles and X-rays, spin devices, processors and programmable circuits tolerant to failures. It is essential that these circuits and systems are robust to failures and errors, have an efficient heat dissipation efficiency and low cost. The areas of robotics and artificial intelligence will require a large use of neural networks and real-time processing. The possibility of exploitation of Hardware accelerators architectures for neural networks to reduce the energy consumed is another key research line of the program.
The research groups linked to the postgraduate program that act in this theme are: - Laboratory of digital artifacts (LAD); - Laboratory of computer-mediated interaction (LIMC); - Research Group in media discourse and Social Network Analysis (MídiaRS).

Current works in such laboratories and the group address the issues: - interpersonal interaction mediated by digital devices, with research focused on gender issues and to the dispersal of attention due to the intensive use of social networking services online and other types of digital artifacts; - human interaction and digital artifact, which includes research directed to the development of the artificial intelligence, virtual reality, and hardware and software interfaces, represented in the market and industry of games.

In this theme, the graduate program in social anthropology hosts the Navisual - Nucleus of Visual Anthropology, which aims to develop studies in anthropology making use of audiovisual instruments. The goal is to provide theoretical and methodological support to projects and lines of research of the faculty members, researchers and students of masters and doctoral degrees interested in visual anthropology. The program supports Biev - Database of images and Visual Effects, which has the objective of forming a database of media on the ethnological heritage of the urban world of Porto Alegre, in the form of ethnographic collections. The Biev is an anthropological research center on the collective memory and urban aesthetics in contemporary cities in Brazil and internationally. The program faculty and students also participate in the Research Group on Ciberanthropology, who is a national network of researchers that aims to develop research geared to social phenomena engendered in "Cyberspace" from the expansion of information and communication technologies and the modalities of "computer-mediated communication". Finally, the program hosts the Life Sciences Group, which brings together researchers interested in the contemporary debates in the field of Social Studies of Science and Technology (ESCT) which exploit the links between science, technology, culture and power.

The PPG-Epidemiology, counts approximately 30 faculty originated from different areas (medicine, dentistry, pharmacy, speech, nutrition, statistical and Anthropology), and graduated over 300 students who are successfully find academic placement or in the health system. The program has 10 lines of research that cover topics of global importance, focusing on national and international collaborative projects, many with large companies partnerships. In the last decade the program has been attracting foreign students (from Uruguay, Angola, Ecuador, Colombia) or for the realisation of research internships as students or has supported newly graduates for post-graduate studies abroad (in the United States and England). This multidisciplinary character demonstrates the contributions of the program towards this research theme. In relation to this specific topic, the program has a collaborative experience with the Postgraduate Program in Computing (PPGC/UFRGS) in machine learning, other collaborations with the program of Psychiatry/UFRGS, and with McMaster University in Canada. The Project TELEHEALTH-RS, has been expanding its international activities: currently collaborates with the University of Ottawa, Canada; it participates in the Brazilian government action involving telehealth in Mozambique, as well as receive Australian student participation in research. There are actions of other projects, partnerships, initiatives and national and international cooperation including with the University Paris-Descartes.

The research group in remote sensing and geographic information systems has international experience in terms of research and education through a Capes-Mercosur project developed with Universidad de San Juan (UNER) - Argentina, in the integration of research groups in the environmental area, rural development and education in the field, especially in the application of technologies associated with the use of remote sensing and geographic information systems.

In relation to research theme 3, the program hosts research on developments of programs for extraction of data related to computational linguistics and also in the development and study of applications and computational tools for language teaching and translation, with the objective of streamlining the sharing of scientific knowledge and assist directly the translator's work. Under this theme researches are being developed on online resources (glossaries,
learning objects, tools to aid to writing) that have the objective of promoting the improvement of academic literacy of students, teachers, and staff of our university. These resources are being made available on the Virtual Learning Environment LUMINA languages. An agreement between the "Instituto de Letras/UFRGS" and the "Faculdade de Letras da Universidade Paul Valéry - Montpellier III, France is under construction. At the same University, an academic mission was organized in 2016, "Teachers in university mobility" to visit the lab team Pique, and Department of Portuguese. Professor Andrée Lepage, from Laval University (Quebec, Canada), taught a free course at UFRGS in 2017. Currently, a faculty member is on sabbatical at the Research Group of terminology and organization of knowledge (GTERM), Faculty of Information and Communication, Universidad de la República Argentina. As invited professor, our faculty teaches a masters course in the same faculty, and from her post-doctoral studies, a formal agreement is already in preparation. The same professor will act as a visitor at PUC-Chile to teach course on phraseology in the Masters in Translation program. Agreements with the University of Granada and with the University of Manizales are also being prepared. Professor Mara Ruth Glozman, from the University of Buenos Aires, taught a Free Course, in 2017 by invitation of the line of research on discursive and textual analysis. The program aims at fostering the dialogue with Prof. Pedro Luis Luchini from the Universidad Nacional de Mar del Plata, who also gave a free course in the program this year. The program also aims at strengthening the cooperation with the University General Sarmiento, Buenos Aires, Argentina.

**PPG Grade in the Quadrennial**

**Biological Sciences (Physiology) 5**

**Background**

The program has research collaboration with the Department of Physiology and Neurobiology, Dartmouth Medical School (Dartmouth University). In 2010, Professor Luciano Stürmer de Fraga was a visiting professor at the Laboratory of Dr. James Leiter (Dartmouth Medical School), where he developed a project on the role of astrocytes of chemosensitive nuclei of the brainstem on the control of breathing. The faculty has since maintained contact aiming to strengthen relations between the laboratories fostering the exchange of researchers and students.

**PPG Grade in the Quadrennial**

**Sociology 7**

**Background**

The Theme 3 deals with the future of work in a context of insertion of new technologies. It is noteworthy that the program in sociology has a line of research called "consolidated Work and Society", whose goals include the analysis of the implications and limitations of the dynamics of the productive processes, in the face of the new paradigm of production and development and diffusion of information and communication technologies; the transformations in the labor market, in labor relations and employment, in the enactment of relevant social actors in these processes: employees, employers, governments, institutions of collective representation. Regarding international projects in this line, we can highlight the research developed in the context of the research group work and recognition, certified by CNPq, among which includes the Project: "Traducteur.e.s indépendant.e.s en France et au Brésil : Ambivalences Monodromy et de l'Autonomie". This research is continuing the previous work, taking as its focus the work of translators inserted in different areas and with different bond, in France and in Brazil. From the empirical exploration, it is understanding how the actors bestow meaning to their insertion in the work in relation to new forms of work in the process of institutionalisation (in relation to which the work of a translator is emblematic). In theoretical terms, the goal is, from the theory of Honneth, to reflect upon the ambivalent dimensions of autonomy at work. This project is funded by the Fondation Maison des Sciences de l'Homme - FMSH, which covers the financing of research internship in France. Also noteworthy is that line the project "ZOGRIS AGGREGATOR. L'engine versions des professional d'emploi et nouvelles consistent d'inégalités : Vers une comparaison des zones grises", which is in progress since 2014 and proposes a comparative study between the United States, France and Brazil, aiming to explore the emerging configurations of access to labor and employment, being financed by the Agence Nationale de Recherche (France). Professor Cinara Rosenfield, two undergraduate students, three academic masters students, and three doctoral students participate in this research.

**PPG Grade in the Quadrennial**

**History 6**

**Background**

Themes related to the future of work, in different periods and regions, from prehistoric times to the present are comprehensively investigated by faculty and students of the graduate program in history, fostering agreements supported by CAPES-Cofecub (Brazil/France), international publications (articles, books and book chapters compilations), post-doctoral programs and Internships for Senior Faculty, sandwich internships and research visits. In the same theme, the program also has consolidated a practice that promotes its international environment and reinforces academic networks: the program offers courses taught by staff from the Program and by invited faculty from abroad. Some examples enforced in the last Quadrennial period and linked with lines are the courses on "History policy: new objects, new perspectives", taught by Dr. Benito Schmidt (UFRGS) and Jordi Channel Morell (EHESS, by means of a Visiting Professorship from CNPq), in 2014; - the course on "Characteristics del proceso de emergencia of indigenous movements in Latin America: the demands of collective autonomies y Derechos del pueblo Mapuche", taught by doctors Augusto Samaniego (University of Santiago of Chile - Usach - invited under the Visting Faculty
Program of the Montevideo Group of universities) and Eduardo Neumann in 2015; - course on "Metamorphoses of French society in the industrial era: elements for a history of social protection in France", taught doctors Michel Pigenet (Université Paris I) and Carla Brandalise (PPGH-UFRGS), in 2016; - course on “archeological language the historical narrative - the average Syrian Euphrates Archaeological Project (PAMES): the site of Tell el-Abu al-‘atiq”, taught by doctors Francisco Caramelo and Maria Helena Trinity Lopes (Faculty of Social Sciences and Humanities - Universidade Nova de Lisboa), Anderson Vargas and Kátia Pozzer (PPGH-UFRGS), in 2016; - course on "Portuguese and Africans in the context of the opening of the Atlantic: XV-XVII centuries", taught by doctors John Marinho dos Santos (University of Coimbra) and Joseph Rivair Macedo (PPGH-UFRGS), in 2016.

PPG Grade in the Quadrennial
Agricultural Microbiology and the Environment

Background
Aiming at the development and integration of new technologies the program fosters collaboration with Prof. Dr. Leonardo Sechi, Università di Sassari, Italy studying the enterococci isolated from various environments. In 2013, the program began a collaboration with the Center for Coastal Studies, Marine and limnological and since then has carried out studies with enterococci in marine animals. In 2015, we began a partnership with Prof. Dr. Michael Gilmore, Harvard University, who is the reference researcher in enterococci and is currently studying the presence of enterococci in wild animals. This partnership aims at the integration of new technologies for the study of enterococci from animals in the wild. For the year 2018, we will apply for a program of Harvard University, the Lemann Brazil Research Fund which supports the cooperation of students and exchange students from our group, the Group of the Dr. I.L. B. C. Camargo from USP and Dr. Gilmore. Still aiming at the development and integration of new technologies in 2016, we began a collaboration with renowned researchers - Prof. Dr. Patricia Poeta and Prof. Dr. Gilberto Iglesias from the University Trás-os-Montes and Alto Douro in Porto, Portugal. Both researchers work with enterococci isolated from wild animals in Portugal. We are planning for 2018, sending a student to learn the technique of multilocus sequence typing (MLST) in the laboratory of Dr. Gilberto Churches, that offers infrastructure necessary for the execution of experiments, as well as extensive experience in this area. In 2012 we conducted an International Symposium on Biotechnology Center, in Porto Alegre, and researchers of the main groups that investigate Escherichia coli extraintestinais worldwide were present at the meeting: Charles Dozois, INRS, Canada; Catherine Schouler, INRA, France; Lisa Nolan and Catherine Logue, Iowa State University, USA; C. Mellata, then at Arizona State University, USA; Jorge A. Girón, then in the Emerging Pathogens Institute, USA, and various Brazilian researchers in the area (Renata K.T. Kobayashi and Gerson Nakazato, Universidade Estadual de Londrina; Wanderley Dias da Silveira, Unicamp; Antonio José Piantino Ferreira, USP).

PPG Grade in the Quadrennial
Molecular and cellular biology

Background
The Graduate Program in Molecular and Cellular Biology has research activities directly related to this theme, highlighting the development of computational models of high fidelity for study of the molecular determinants of pathologies, as well as their application.

PPG Grade in the Quadrennial
Computing

Background
The researchers from the Graduate Program in computing work on this subject through the following research projects and related activities:
-Projects funded in partnership with the University of Oslo aiming to advance knowledge in Robotics and Artificial Intelligence in several applications.
- Project and lines of research aiming at the development of innovative techniques of text miningL researches developed in conjunction to foreign researchers in the areas of AI, Machine Learning and reasoning.
- Research Cooperation, through projects in the areas of Internet Exchange Points (Computer Networks), internet security systems, large scale on the internet with partners in Germany, France, Netherlands, Belgium, Portugal and South Korea.
- Research Cooperation with the countries of the BRICS group, in the context of the Edital CAPES BRICS countries, aiming at the establishment of Graduate Program between these countries.
- Research project selected in joint call Brazil-Europe, jointly financed by the European Union's Horizon 2020 and the MCTI, in the area of computer networks: Federated Union of Telecommunications Research Facilities for an EU-India Open Laboratory, with partners: Trinity College Dublin, University of Bristol, Teknologian Tutkimuskeskus VTT Oy (Finland), Instituto de Telecomunicações - Aveiro (Portugal), Intel Mobile Communications GmbH (Germany), and Imec (Belgium).
- Research Project in the area of network security jointly funded by the National Science Foundation (United States) and RNP (Brazil).
- Research Project on Humano-Computador Haptic Communication for interaction.
- Research Project on Fault Tolerance in systems for the detection of objects for automotive and aerospace applications.
- Research Project with European funding for the development of accelerators for low energy software.
- CAPES STIC AMSUD project involving researchers from Brazil and abroad: Parallel and Distributed Metaheuristics for Structural bioinformatics.
- Project and research on line balancing and designation of workers in production systems with disabled workers.

**PPG Grade in the Quadrennial**

**Social and Institutional Psychology** 5

**Background**
The program justifies its participation in this theme because the faculty of the program act and develop projects that address the impacts of technologies in the health of workers. The program develops several international collaborations described in these lines of research, notably with: the Autonomous University of Barcelona, participation in the Committee Coordinator in Brazil of the International Covenant ARUC-Brasil-Canadá, University of Montreal, Quebec, University of Wisconsin-Madison, University of Groningen, University of Santiago-Chile, University of Porto, University of Iceland, University of Toronto, University of La Republica, Uruguay; Pontifical University of Valparaíso, Chile, Pontificia Universidad Javeriana (Colombia), University of Havana, National University of Colombia and the Escuela Latinoamericana de Estudios de Graduate Universidad de Arte y Ciencias Sociales - arcs of Chile, the University of Louvain/Belgium, King's College London, London School of Economics and Political Science, University of Coimbra.

**PPG Grade in the Quadrennial**

**Administration** 5

**Background**

Among the themes addressed in the projects are those relating to sustainable development in their various perspectives, innovation and competitiveness, and to the training of human resources at a high level, which are investigated in the context of societies and organizations. In this way, the program contributes to the formation of a high level of intellectual capital to engage faculty and students in teaching, research and extension activities that are effectively aligned to research themes of the program and the demands of the country as a whole. In the last three years, the faculty members of the program developed international relations with 46 different international institutions, especially in countries such as the United States, France and the United Kingdom. The main activities performed were international missions and research projects with the partner institutions, which resulted in joint publications and exchanges of students and teachers. It should be emphasized that more than 75% of teachers of the program developed research projects in conjunction with institutions at international level in this period. At least 18 students participated in a sandwich internship with these partner institutions. Most of the international relations developed over the last three years continues with these institutions, which includes the development of new projects and negotiations for dual diploma degrees. In addition, new projects are being developed with universities in countries such as India, China, the United States and Norway.

**PPG Grade in the Quadrennial**

**Civil Engineering: Construction and Infrastructure** 5

**Background**
The Program in Civil Engineering - Structures justifies its actions on Theme 3 by the following: NORIE, one of the laboratories of the program constitutes one of the most important national research centers in the implementation and dissemination of Building Information Modeling (BIM) in the civil construction industry. This technology is regarded as the new paradigm in modeling of information and automation in the industrial sector, requiring substantial changes in how processes are managed. Several studies and activities of post-graduate education have been developed in partnership with institutions abroad, including the University of Huddersfield (Great Britain), University of Liverpool (Great Britain), University of Texas, Austin (USA), and Aalto University (Finland). In particular, we highlight the following activities: Prof. Patricia Tzortzopoulos, Professor of Digital Design at the University of Huddersfield, has served as a visiting faculty for four years at UFRGS, with a Visiting Professorship from CNPq. This project was titled "Use of BIM technologies in joint ventures of social relevance: applications in the conception, design and planning in housing and health". Professo A. Kiviniemi, Professor of Digital Design, the University of Huddersfield, visited Brazil on three occasions, all of them at the invitation of Prof. Carlos Formoso. Prof. A. Kiviniemi teaches regularly since 2012 a course on BIM and Integrated Project Delivery. Prof. Carlos Formoso ministered in 2016 a course on Design Science Research for doctoral students at the University of Liverpool. Prof. Barghay Dave of Aalto University, regularly teaches since 2012 a course on BIM and Integrated Project Delivery. Prof. Eduardo Isatto attended a fellowship for a visit under Erasmus+ to visit the Aalto University in 2016. In 2015, Professor Eduardo Isatto went on an academic mission to the University of Texas, Austin. He will hold a senior fellowship at the University of Texas, Austin for 12 months from 2018. Overall collaboration UT Austin has been expanded with possibilities of phd-sandwich internships and senior visists of the program faculty.

**PPG Grade in the Quadrennial**

**Electrical Engineering** 6

**Background**

This theme is associated to two research areas of the program: (i) Computer Engineering and (ii) Control and Automation. The activities in these areas are concentrated on the following topics: - Systems of mobile robotics and
industrial applications. - digital signal processing. - machine learning. The relationship of the researches carried out within the proposed theme justifies the inclusion of the program in this theme.

PPG  Grade in the Quadrennial
Computers in Education  7

Background
In the PGIE research and continued production of innovative knowledge in areas such as Informatics, Education, Psychology, among others, are being developed, enabling teaching professionals to interact with new technologies in their work environments. In particular it is noteworthy the investigations in the area of recommendation systems, educational games, mobile learning, virtual laboratories using immersive worlds to support education in science and mathematics. It can be argued that the central aspect of the program (Computers in Education) is directly related to the integration of new technologies for the future work of educators and, consequently, is indirectly related with the future of the work of all professionals whose training pass through a process of formal or informal education. In this line the PPGeIE identifies international cooperation with Universidad Javeriana of Bogotá (Colombia), University of Aveiro (Portugal), and the research groups linked to Internet2 (Indiana University - Chicago).

Theme 4

Theme 4 – Large-scale Health Sciences, Translational Medicine and its socio-economic impact

PPG  Grade in the Quadrennial
Electrical Engineering  6

Background
This theme falls into two areas of concentration of PPGEE: (i) Computer Engineering and (ii) Control and Automation. The activities in these areas are concentrated on the following topics:
- Analysis of biological effects of electromagnetic waves, in the age of non-ionising radiation
- INR includes theoretical studies and simulations of the effects of electromagnetic fields in the body and head for adults and children.
- Application of Digital Signal Processing, Robotics and artificial intelligence techniques in assistive technologies.
- The development of sensors for biomedical applications.

PPG  Grade in the Quadrennial
Nursing  5

Background
Nursing belongs to the area of Health Sciences from CNPq. The PPGENF-UFRGS is a program of significant importance in the formation of teachers and researchers in health and nursing in the country, in particular in the context of the Southern Region. It is structured in two areas of concentration (AC), which cover topics current and relevant to nursing and health, contributing to the formation of human resources. In particular, in the area of concentration policies and practices in health and nursing, which covers topics related to public policies and attention to individuals and groups; analyzing the production, organization and evaluation in health and nursing; includes studies related to the promotion, education and surveillance in health and nursing.

PPG  Grade in the Quadrennial
Medicine: Medical Sciences  6

Background
The Graduate Program in Medicine: Medical Sciences of the FAMED/UFRGS, has invested heavily in the process of internationalization. The lines of research that will be explored by researchers of PPGCM and justifying its insertion in Theme 4 are: Clinical and experimental neuroscience
- Clinical and molecular genetics, human reproduction, bioethics and translational medicine
- Epidemiology, pathophysiological processes, diagnostic and therapeutic
- Clinical Pharmacology and experimental.

PPG  Grade in the Quadrennial
Civil Engineering: Construction and Infrastructure  5

Background
Theme 4 includes the research related to the improvement of the buildings in the area of health (healthcare facilities, including hospitals, health and long term care homes for people with special needs). Some research has been developed in conjunction with the PPGEP-UFRGS (Production Engineering). We highlight the following research activities: The Pros. Patricia Tzortzopoulos and Mike Kagioglou, of the University of Huddersfield, School of Art, Architecture and Design, who work on this subject, have visited the UFRGS in various opportunities in the recent years. In 2011, Prof. Carlos Formoso was Visiting Professor for a period of 9 months at the University of Salford, on the invitation of Prof. Mike Kagioglou. Prof. Patricia co-supervises currently two students (1 M.Sc. and 1 Ph.D.) who are developing studies in the HCPA - Hospital das Clínicas de Porto Alegre (part of UFRGS). She has already visited the hospital several times and gave a lecture for researchers of the HCPA and the School of Engineering of the
PPG  Grade in the Quadrennial
Psychiatry and Behavioral Sciences (Psychiatry)  7

Background
The research groups of the PPG Psychiatry and Behavioral Sciences (PPG Psychiatry) of UFRGS are guided by three major lines directed to the mental health of populations, with translational work and interactions between the following groups: (1) Mental Health of Children and Adolescents; (2) Mental Health of adults; (3) Mental Health of vulnerable groups. We have developed surveys that are intended not only for the treatment of diseases but also to the prevention and the health promotion. The program has international collaboration in research and training of human resources with major research centers in the area, in Europe, the Americas and Oceania, with a high index of publications and outstanding performance in the formation of human resources. The program aims, at the end of this program of internationalisation, to achieve the following objectives: (a) the improvement in human resource training to work in the country; (b) We anticipate that approximately 80% of subjects shall be taught in English; (c) generation of
new technologies that reflect on the mental health of the population; (d) Registration of Intellectual Property of new technologies generated and transfer this knowledge; (e) participation in work and partnerships involving a greater number of subjects for scientific terms greater repercussions and, as a consequence, to give more precise answers to the problems of population; (f) to increase the impact of publications and consolidation of the UFRGS, in the international scenario.

**PPG  Grade in the Quadrennial**
Pharmaceutical Sciences  
7

**Background**
The Program has some interface with other graduate programs within UFRGS, as well as with universities of other Brazilian States, and with international partners. The subgroup of Pharmacology - Pharmacokinetics has developed projects in the area of translation medicine from pre-clinical data to clinical scenarios, through physiological modeling population pharmacokinetics of oral hypoglycemic agents and antimicrobial agents. These projects have been developed by doctoral students of PPGCF, having received funding from CNPq (editais universal) and FAPERGS. The focus has been the search of mathematical models (popPK), pharmacokinetic and pharmacodynamic, and pharmacokinetic stocks (popPK/PD) to describe the temporal provision of drugs in the body, and the relationship of this with the pharmacological effect, aiming at optimizing the use of drugs in humans, both in the situation of treatments, such as in situation of surgical prophylaxis, in the case of the antimicrobials. The proposal seeks to deepen the abilities of the group in the evaluation popPK And popPK/PD (the area currently called Pharmacometrics) now in models of disease using specific software. The Program as contacted the University of Navarra, the Manchester University and the University of Paris-Sul, that are experts in the modeling of complex data. The group of "nanomaterials and human effects" is also engaged on the Theme 4, that carries out activities on atmospheric pollution and occupational health and human health with funding from CNPq and Fapergs. In addition, the research group on toxicology has joined the international consortium NanoReg and, on nanomaterials and allergens, the Ph.D. student Elisa Sauer has started a collaboration in Austria with the Prof Dr Albert Duschl. Their proposal is to assess the potential effects of nanomaterials on health. Prof. Dr. Keld A. Jensen has worked both on the level of risk analysis of nanomaterials as in ratings in the occupational environment and has offered to assist us in this area that is brand new.

**PPG  Grade in the Quadrennial**
Physics  
7

**Background**
The Graduate Program of Physics (PPGFis) has strong work on advanced materials. The development of new materials with new properties is indispensable for the advancement of various areas of science, including artificial intelligence and robotics. The PPGFis works on the development of projects implemented in the area of microelectronics (photo sensors, smoke detectors and X-ray particles), as well as in the development of spin devices. The PPGFis has also highlighted performance in the following lines of research: (1) techniques for networks theory and simulation are used for data analysis of large-scale gene expression data. It collaborates with the Institute of Childhood Cancer (ICI) on the determination of the metabolic differences presented by Ewing Sarcoma metastases when compared to less advanced versions. The technique is used for the study of several types of cancer of the mouth and diseases of genetic origin as the polycystic kidney disease. PPF collaborates with the Graduate Program in Genetics, to analyze data from gene expression of soybean and rice. The PPGFis also develops simulation techniques of active substances. Many living organisms are endowed with the ability to migrate and reorganize themselves, which is necessary for the development but is also associated with certain diseases (such as cancer metastasis). The interest is to investigate the possible behaviors of systems formed by many live agents, which requires the formulation of models that explicitly take the migration activity, as well as the death and proliferation of these agents. Applications range from the development of the embryo to the investigation of how metastases cells form and invade other tissues, or how cells of the immune system are capable of an inflammatory response. The PPGFis presents concrete results in this line: (i) a description and modeling of the dynamics of living systems and their functions, using physical foundations. (ii) Software for data analysis of gene expression on a large scale; (iii) Proposal for treatment of polycystic kidney disease, from the data analysis of gene expression. International Patent Application.

**PPG  Grade in the Quadrennial**
Computation  
7

**Background**
The researchers from the Graduate Program in Computing work on this Theme through research projects and related activities:
- 3D Viewing and interacting applied to the simulation of medical interventions, with research in partnership with the Rensselaer Polytechnic Institute (Troy, NY), Prof. Sujuan.
- Prediction of bipolar disorder in young depressed, headed by Prof. Claudio Jung, in partnership with McMaster University (Canada) and HCPA.
- Academic Exchanges with focus on technologies for the Health Area, in partnership with Halmstad University (Sweden).
- Bioinformatics applied to personalized medicine: from diagnosis to treatment of diseases, coordinated by Marcio Dorn, in partnership with Dr. Mathias J. Krause (Karlsruhe Institute of Technology, Germany) and Dr. Mario Inostroza-Ponta (University of Santiago de Chile, Chile). With the potential for collaboration with University of Newcastle (Australia), University of Manchester (United Kingdom), Université Pierre et Marie Curie (France).
- Project HUGE YES - Hapto-Graphic Unified Engines is simulated Medical Interventions (Contract negotiation with Simedis AG), in partnership with the HCPA (Leandro Totti Cavazzola) and Simedis AG (Switzerland).

The PPG Computing also includes a series of activities and projects in development with local and national partners, with great social impact and potential for development projects with international partners:
- Project Thin@Healthy: mobile application for slimming with monitoring of professionals;
- Project of Surgical Room: intelligent system of education and medical perception for discussion of surgical techniques;
- Vtraining Project: a system for centers of realistic simulation (teaching of medical techniques);
- Mobilecare Project: a system for monitoring chronic - Ambient Assisted Living);
- Project of Teleophthalmology: Eye Care system for distance learning; - Multipresença Project: videoconference system integrating high definition (Telepresence), web conferencing and legacy systems;
- Mconf Project: web conferencing system. These activities led to the creation of two spin-offs companies: Mconf Tecnologia Ltda. and I9Access Tecnologia Ltda.

PPG Grade in the Quadrennial
Microelectronics 5

Background
The evolution of robotics in recent years shows that, in the future, these machines will be fundamental to the lifestyle of humanity. In fact, computers and robots are already critical in medical applications, to support surgeries for example. Autonomous Robots surgeons have already been tested for years. This type of system, which deals with human lives, must be extremely safe, once an error can cause a catastrophe. Therefore, the study of techniques for fault tolerance is essential for the evolution and development of systems and circuits that deal with human beings (called critical systems). The PGMICRO has been studying techniques of tolerance for years, aiming to protect critical systems of various types of possible errors for which human lives are not acceptable. The development of national, critical technologies that are tolerant to failures is fundamental to reduce their costs, which would make them available to the population. Our research projects in this area already benefit from cooperation agreements with several countries that already have evolved more in this area and have high international visibility.

PPG Grade in the Quadrennial
Biological Science (Neuroscience) 5

Background
These are the topics already in development in this theme: (i) projects concerning the effects of early adversity on the behavior and relations with neurochemical changes; studies in animal models of stress effects, prenatal or childhood screening and how they affect food habits; cognitive aspects related to anxiety and mood. (ii) studies of gene interactions vs. environment and influences on child behavior, studies of the interactions between the genetic inheritance in genes related to neurobiological functions, exposure to adversity fetal or neonatal and the risk for the neurodevelopment of psychopathology in children at different ages. These studies are highly focused on translational medicine. (iii) studies in the differential susceptibility to the environment, and its effects on obesogens behavior. (iv) studies in intrauterine growth restriction (IUGR) and feeding behavior in rodents, and on the effect of IUGR on the development of the hedonic control system of feeding behavior is another theme that fits this item involving translational medicine and health on a large scale. Collaborations on mechanisms of reconsolidation of memory for the treatment of posttraumatic stress disorder, in a translational approach. The program also analyzes the effects of the association between alcohol and cigarettes in animals. Another theme of research is focused on the study of the mechanisms of refractory epilepsies and goals of treatments, also fits in this line aggregator (translational medicine). There is also research on how maternal behavior affects the development and behavior of offspring in the long term. Researchers are also studying health problems of high prevalence in society, such as Alzheimer disease and post-traumatic stress disorder. Another project on memory proposes a new approach that promises to mitigate the traumatic memories in an effective and permanent. The program also houses research on etiological understanding of Autism Spectrum Disorder (ASD) aiming to generate proposals and strategies for new drugs and identify peripheral markers that can assist in the clinical diagnosis. In 2018 was founded the group of Translational studies in Autistic Spectrum Disorder, with team integrating clinical research, currently with 250 patients with ASD and experimental research, with an animal model of ASD.

PPG Grade in the Quadrennial
Genetics and Molecular Biology 7

Background
The researchers involved in this theme develop multiple international partnerships, involving projects in collaboration, exchange of students, publications and exchanges of researchers. C.H.D. Bau - clinical and epidemiological characterization (phenotypic) of attention deficit/hyperactivity disorder (ADHD) and associated disorders. It has international collaborations with the Netherlands, USA, Germany, Spain, Norway, Sweden and the United Kingdom,
which are part of the International Multi-center persistent ADHD CollaboraTion and Psychiatric Genomics Consortium. G. Baldo - development of pre-clinical trials of gene therapy in animal models and human cells with genetic diseases in partnership with the University of Massachusetts and University of Manchester. I.V. D. Schwartz - operates in translational medicine, especially with focus on intestinal microbiota and rare diseases and metabolic diseases. Partnerships with University of Hamburg (ALE), Maastricht(HOL), University of Texas, with submission of project to notice all CNPq/CAPES on the Zia virus; University Children's Hospital Zurick/Switzerland. J.A.B. Chies - COLLABORATES with researchers from the check-Haus and Universitäsklinikum, Essen, Germany; Montpellier, France and University of Trieste, Italy. L.B. Garden - The team of Neurogenetics, which also includes the researcher M.L.S. Pereira has six projects with funding from international agencies and interacts with foreign groups: Center for Research and Rehabilitation of hereditary ataxias, Holguin, Cuba; University of the Azores; University of Groningen and the University of Tuebingen. L.S. Faccini - research on congenital anomalies, its impact on developing countries and strategies for their prevention. Maintains partnerships with low- and middle-income countries in South America, Mexico (Univ. Yucatan, Merida), South Africa, United Kingdom (Scotland), Norway (Oslo). A.p. Prolla - helps oncogenetic bound group focuses on "genetic predisposition to cancer and genetic determinants and their interaction with the environment." International partnerships with the Malkin, Cancer Genetics Program and Genetics & Genome Biology Program, The Hospital for Sick Children, Canada and with the Functional Genomics and Cancer Program in Systems Biology, Lunenfeld-Tanenbaum Research Institute Mount Sinai Hospital (Toronto, Canada) funded by the Israel Science Foundation, the Canadian Institutes of Health Research, International Development Research Center, and Azrieli Foundation.

PPG Grade in the Quadrennial
Biological Sciences: Pharmacology and Therapeutics 4

Background
The Graduate Program in Biological Sciences: Pharmacology and Therapeutics (PPGFT) contemplates translational characteristics, integrating new knowledge, mechanisms and therapies in the prevention and treatment of diseases, ranging from basic research to clinical research. The integration of the knowledge generated by basic and clinical research allows the formation of researchers prepared for development of new drugs since the synthesis or derived from natural products, focused on the pharmacokinetic and pharmacodynamic characteristics, until the evaluation of products, considering their effectiveness, efficiency and effectiveness. The Pharmacology is biomedical science situated at the interface between basic research and clinical application directly in the areas of health. It stands out as an area of research in the national and international scene because of integrative science, linking molecular and biochemical knowledge to practical situations of clinical use of drugs. In this context, the PPGFT seeks the production of knowledge in the area of biological sciences, as well as the formation of human resources quality.

PPG Grade in the Quadrennial
Social Anthropology 7

Background
In this context, the Nucleus of Research in Anthropology of the Body and Health; the core develops research in the areas of anthropology of health, gender relations, body, sexuality, HIV/ Aids and has provided advice to health programs and/or projects designed for social intervention. In addition, the Program has research projects linked to this theme as follows: (1) gender, sexuality, brain and hormones from the scientific discourses of great movement: an analysis of the uses of science, communication and heterogeneous interfaces; (2) the popularization of scientific knowledge concerning differences of gender and sexuality: new discoveries in relation to the old prescriptions; (3) processes of subjectionization, bodily transformations and productions of gender via the promotion and consumption of biomedical resources.

PPG Grade in the Quadrennial
Health sciences: Cardiology and Cardiovascular Sciences 6

Background
Our Program emphasizes the following partnerships in which the teachers of the PPG Cardiology exert leadership positions: (a) THE INCT/lat, coordinated by teachers Flávio Danni Fuchs and Carisi Anne Polanczyk, works collaboratively with nine more educational and research institutions in the country. The lat is an initiative of the CNPq, DECIT, Ministry of Science and Technology and the Ministry of Health and gathers a group of more than eighty researchers linked to universities leaders in research in the area. Aims at guiding and assessing the use and implementation of different technologies in health systems in Brazil. In this context, it seeks to develop scientific and technological research in the evaluation of new health technologies, and acts in the formation of human resources and the dissemination of knowledge, in order to meet the interests of the SUS, supplementary medicine and society as a whole; b) National Network of Clinical Research (RNPC), which aggregates teaching hospitals, in institutional model of clinical research based on the best practices of research focused on the urgency of the Sistema Único de Saúde, triggering the creation of an adequate infrastructure and a progressive source of well-trained researchers; c) the Brazilian Network for Health Technology Assessment - Rebrats. Since 2010, several teachers of the program participate in this initiative of the Ministry of Health (SCITE AND DECIT) to promote careful analysis of technologies to be incorporated in the SUS; d) the Brazilian Network of studies on congestive heart - REBIC. In 2014, through the public call CNPq/MS/SCTIE/Decit no.33, the group of teachers of the program was contemplated with the constitution of the project, which involves researchers from various national universities; e) Predict - Notice Pronex/CNPq and
FAPERGS 12/2014, for the formation of National Institute of Science and Technology. The core of researchers conduct projects directed to interventions to reduce risk factors for cardiovascular disease, and includes institutions throughout Brazil and reference groups abroad; f) Bioinformatics applied to personalized medicine: from diagnosis to treatment of diseases. The project aims to develop and implement strategies to integrate, explore and analyze genomic data and to identify new biomarkers with diagnostic or prognostic value and potential therapeutic targets.

**PPG Grade in the Quadrennial**

**Human Movement Sciences** 6

**Background**
The PPGCMH has a tradition in research in Physical Activity and Health with projects on the development in the relationship between human movement and its preventive effects and rehabilitation in diseases related to physical activity; as well as the line of research "physical activity and performance" with research projects under development, learning, training, and motor performance. The conjunction of strategies of epidemiological research shows the efforts in promoting studies of health sciences on a large scale. Even more basic research, observational comparative, preclinical and clinical, as well as randomized clinical interventions configure the efforts of teachers of our program in translational research. The research on "Physical Activity and Health" and on "Physical Activity and Performance" is conducted by Professor Nadia Cristina Valentini who has developed several large-scale studies demonstrating the difficulties in the coordination and control of fundamental movements and delays in mark motors of children affected by Developmental Coordenative Disorder. This disorder dramatically affects a wide range of fine motor tasks, balance and mobility of children. These initial studies have enabled the implementation of epidemiological studies randomized activities. Professors Leonardo Alexandre Peyré Turtle and Aline Nogueira Haas have conducted studies on the clinical and functional adaptations to different physical therapies in people with Parkinson disease. Professors also develop studies under biomechanical, physiological, and psychosocial approaches, involving physical therapies such as nordic walking, aquajogging, dancing and physiotherapy. A project along this theme has received support from the Edital Fapergs/State Health Secretariat/RS “SUS: shared management in health (PPSUS) – 2017”.

**PPG Grade in the Quadrennial**

**Dentistry** 6

**Background**
In relation to Health Sciences in large scale, this is the primary vocation of PPG, covering the entire spectrum of Dentistry, both for the individual attention as under collective, with relevant academic production and interdisciplinary. Our integration with other areas of knowledge is a strong indication that the academic production is in line with contemporaneity. The economic studies in health are part of the activities of our Program, which has the potential to improve health systems in Brazil and in other countries, especially by strengthening the integration of the south-south axis.

**PPG Grade in the Quadrennial**

**Public policies** 5

**Background**
The Professors of social policies have on-going collaborations with the Institute of Social and Political Sciences of the UTL, Portugal. One of our research group has worked in research projects involving the relationship between humans, animals, technologies, environment and health; one of its themes is the ethnography of policies and practices of surveillance, prevention and control of Aedes aegypti in different cities of Brazil and Argentina, including concerns with yellow fever, dengue, the zika and Chikungunya. Another theme is the focus on emerging problems related to Leishmaniasis, its broad scope of social impacts, especially in peripheral countries. Both themes are examples of how the health and environmental emergencies have attracted the attention of anthropology. The anthropological attention directed to the linkage between human and animal health to the environment also allows analyzes the crossing of nation-state and international themes like economy, customs and morals, from the standpoint of various fields of interest, such as the biopolitics and microbiopolítica, of human-animal relationships and multispecies, global health, anthropology of science or of new digital technologies. Our Program has on-going agreements with Argentina (CeNDIE (National Center for diagnosis and research on Endemo-epidemics), France (LAS - Laboratoire d'Anthropologie Social - Équipe de Recherche Relations hommes/farme: questions contemporaines), England (KCL - King's College London and China-Hong Kong (CUHK - Chinese University of Hong Kong).}

**PPG Grade in the Quadrennial**

**Molecular and cellular biology** 7

**Background**
The researchers involved in this line develop multiple international partnerships, involving projects in collaboration, exchange of students, publications and exchanges of researchers – C.H.D. Bau - clinical and epidemiological characterization (phenotypic) of attention deficit/hyperactivity disorder (ADHD) and associated disorders. It has international collaborations with the Netherlands, USA, Germany, Spain, Norway, Sweden and the United Kingdom,
which are part of the International Multi-center persistent ADHD Collaboration and Psychiatric Genomics Consortium. G. Baldo - development of pre-clinical trials of gene therapy in animal models and human cells with genetic diseases in partnership with the University of Massachusetts and University of Manchester. I.V. D. Schwartz - operates in translational medicine, especially with focus on intestinal microbiota and rare diseases and metabolic diseases. Partnerships with University of Hamburg (ALE), Maastricht(HOL), University of Texas, on the Zika virus; University Children's Hospital Zurich/Switzerland. J.A.B. Chies - COLLABORATES with researchers from the Universitätsklinikum, Essen, Germany; Montpellier, France and University of Trieste, Italy. L.B. Garden - The team of Neurogenetics, which also includes the researcher M.L.S. Pereira has funding from international agencies and interacts with foreign groups: Center for Research and Rehabilitation of hereditary ataxies, Holguin, Cuba; University of the Azores; University of Groningen and the University of Tuebingen. L.S. Facci - research on congenital anomalies, its impact on developing countries and strategies for their prevention. Maintains partnerships with low- and middle-income countries in South America, Mexico (Univ. Yucatan, Merida), South Africa, United Kingdom (Scotland), Norway (Oslo). A.P. Prolla – leads an oncogenic-bound group with focus on "genetic predisposition to cancer and genetic determinants and their interaction with the environment." International partnerships with the Malkin, Cancer Genetics Program and Genetics & Genome Biology Program, The Hospital for Sick Children, Canada and with the Functional Genomics and Cancer Program in Systems Biology, Lunenfeld-Tanenbaum Research Institute Mount Sinai Hospital (Toronto, Canada) funded by the Israel Science Foundation, the Canadian Institutes of Health Research, International Development Research Center, and Azrieli Foundation.

PPG Grade in the Quadrennial
Child and Adolescent Health 5

Background
In this theme there are several professors engaged in research topics related to "Health Sciences aggregator on a large scale, translational medicine and its socioeconomic impact econômico", including two main topics of research: 1. Clinical, epidemiological and evolution in Pediatrics Description: Studying the congenital and environmental situations that interfere in the performance physical, emotional and social aspects of child and adolescent. Professor Clécio Homrich da Silva, Elsa Regina Helena Ayako Sueno Goldani, Marcelo Zubarar Goldani, Mário Bernardes Wagner, Sady Selaimenn da Costa, Renata Rocha Kieling, Tânia Ferreira Cestari. 2. Epidemiology, pathogenesis, phenotype, genotype, treatment and prevention of congenital defects. Description: Studying the clinical, epidemiological and genetic of the genomic changes and aberrations, proposing therapeutic and preventive actions. Professors: Roberto Giugliani, Sandra Leistner Segal, Ursula da Silveira Matte. It emphasizes the line of translational research in pediatrics, replicating events identified in humans through observational studies in animal models with the objective of determining possible molecular physiological mechanisms. This line of research already has resulted in a series of publications and on-going projects.

PPG Grade in the Quadrennial
Performing Arts 4

Background
Also in the intersection with theme 8 are the relations established with the Doctoral Program in studies and artistic practices of Universitè du Québec à Montreal (UQAM) and with the Department of Dance at the University Paris-8. Professors Monica Dantas (2008) and Suzanne Weber da Silva (2010) develop projects as follows: (a) visit of Professor Sylvie Fortin to PPGAC, which ministered to lecture and discipline Special topics in Scenic Arts; b) visit of Professor Andrée Martin (UQAM) with the objective of presenting two works choreographic (S-sensation et U-usage) in joint action with the Dance Festival.com/Porto Alegre; c) scientific missions of short duration abroad for post-graduate students in the Department of Dance and the doctorate in studies and artistic practices; d) visit of Professor Monica Dantas to the Department of Dance of UQAM in 2014; e) visit of Professor Sylvie Fortin at UFRGS in 2015 to participate in the International Symposium of Sport, Health and Interdisciplinarity; f) Publication of articles of Professor Fortin and Professor Martin in Scene - Magazine of PPGAC/UFRGS. Collaboration with the Department of Dance at the University of Paris-8 began in 2011, after the conclusion of the 5th Scientific Meeting of the Brazilian Association of Research and Graduate Studies in Performing Arts (HUG) at UFRGS. Research themes linked to the proposal of an intersection between Themes 4 and 8 are as follows: embodied practices and artistic, dance and theater, for promotion of health, with an emphasis on the well-being of women and labor market - body preparation alternatives, including techniques for theater and dance, aiming at the breakup of gender hierarchies and the silencing of differences - the inclusion of people with disabilities through artistic practices - reading the gesture as a tool for the creation and research in performing arts - somatic Education and processes of creation in scenic arts. It is noteworthy that the proposition of academic exchanges are a result of actions and events organized jointly and funded by CAPES, the UQAM and the University Paris-8, aiming at the development of inter-institutional projects.

PPG Grade in the Quadrennial
Resources and Environmental Sanitation 6

Background
The lines of research actions of PPGRHSA impact directly on this Theme. For example, supply of potable water, sewage treatment plants and its direct impact on the health of the populations.

PPG Grade in the Quadrennial
Biological Sciences (Physiology) 5

**Background**

Professors A. Araujo, A. Belló-Klein and P. Schenkel develop studies in pulmonary hypertension, acute myocardial infarction, and hyperthyroidism, in collaboration with major research centers at the University of Manitoba and Thunderbay, Canada. Professor E. Loss carries out studies in partnership with University College London. Professor F. Benetti, cooperates with the Università degli Studi di Firenze, in research related to the study of the role of the system histaminergic in consolidation, reconsolidation and extinction of Aversive memories in rats, with important implications for the mental health of selected populations. The group of Professor M. Krause investigates the effects of physical activity with different modalities, volumes and intensities in different populations by preventing or treating the development of chronic diseases and their complications. There are on-going collaborations with University College Dublin and Curtin University (Perth-Australia).

**PPG Grade in the Quadrennial**

**Medical Sciences: Endocrinology** 6

**Background**

The two main areas of our Program involve comprehensive projects on relevant issues in the area of health sciences as clinical problems, Physiopathogenic, diagnostic methodology and basic research. Since its inception, the focus of the program has been to maintain a highly qualified scientific production and training of human resources, with an emphasis on training for future independent researchers. In the last decade, the translational medicine theme has been quite evident in our publications. In the last year we started collaborations with teachers from Informatics Institute of UFRGS. More specifically, the research group of Professor Daisy Crispim Moreira has conducted studies involving bioinformatics in collaboration with Professor Mariana Recamonde-Mendonza. The first study resulting from this collaboration was recently published (Endocr Connect. Nov 2017;6(8):773-790) and three more scientific papers are in the process of submission for publication. Another interaction with the Institute of Informatics was held by Professor Luciana Verçoza Berry with the aim of using tools of Data Science (Big Data And Machine Learning) in clinical studies.

**PPG Grade in the Quadrennial**

**DESIGN** 5

**Background**

The Graduate Program in Design has strong activities in this theme, highlighting the development of several studies which have resulted in theses, dissertations and publications in the following themes: 1) assistive technologies, including focused on elderly and disabled children; 2) human model for ergonomic digital parametric analysis virtual product design; 3) diagnoses on accessibility and technology; 4) methods for lifting of anthropometric parameters using a 3D digitizer for low cost; 5) the designer's contribution in the project of assisted technology resources; 6) the design of assisted technology equipment to aid in the performance of activities of daily living of elderly people and people with disabilities, socially institutionalized; 6) virtual design in ear reconstruction with autogenous material.

**PPG Grade in the Quadrennial**

**Ecology** 6

**Background**

Within the scope of this theme, the PPG in Ecology develops projects associated with the monitoring of mosquitoes in Rio Grande do Sul and in Porto Alegre, oriented to the control of infectious diseases. The studies have focused on monitoring and statistical modeling of population dynamics of vectors of infectious diseases, with an emphasis on Aedes aegypti and dengue. We also conduct research using biomarkers of genotoxicity and toxicity, and teratogenesis, that assess human exposure to environmental conditions derived from pollutants or anthropogenic degradation. Such studies allow to accompany processes of remediation of contaminated areas, defining criteria for the protection of the surrounding environment and health protection of the population affected. This has made it possible, for example, to develop special protocols for health care in conjunction with the team of health surveillance in Brazil, by request of its Ministry of Health.

**PPG Grade in the Quadrennial**

**Chemical Engineering** 6

**Background**

The PPGEQ has been acting in the insertion and international cooperation in various ways. However, this is a point that still needs to be further explored. It is the organization of important events, participation in international committees and entities, obtaining awards of international prominence and in cooperation with universities abroad for research. Special attention is being given to the qualification of both students and professors, through the “sandwich-doctorate” program, as well as post-doctorate programs and short-duration missions. PPGEQ has been conducting important research in the area of methodologies for processing systems in engineering applied to the development of tissues and regenerative medicine.
Materials science 5

Background
This Theme coincides with the topics developed by our researchers. Worth mentioning are the international collaborations maintained since 2013 and the resulting in publications. These scientific papers were published in: J Anal (2016 TO 1439) 144-151; J Anal to 1387, pp. 86-94; SCIENTIA Chromatographica 9:101-116 (2017); J Anal to 1387, pp. 86-94; SCIENTIA Chromatographica 9:101-116 (2017); Bioresource Technology 200 (2016) 680-690.

Epidemiology 6

Background
The ELSA-Brazil (Longitudinal Study of Adult Health) is unleashing collaborative actions in this theme: 1) At the ELSA-RS Center partnerships have been conducted with the Graduate Programs in Genetics and Molecular Biology, and Computing, HCPA and Moinhos de Vento Hospital, for genetic characterization (genotyping and microRNA) of the cohort ELSA-RS; 2) ELSA-RS leads a partnership with the University of Cambridge via Interconnect, a project for completion of meta-analysis with individual data on nutrition, diabetes and obesity. 3) Partnership with the University of Manchester (UK), in order to deepen mental health issues in large urban areas (headquarters of the ELSA-Brazil); 4) ELSA-RS coordinates research on images of echocardiography with cutting-edge technologies and participates in the readings of tomography, with collaborations with Johns Hopkins and Harvard universities; 5) ELSA-RS develops supplemental study for the realization of the audiograms that provide collaboration with international multicenter studies. The WHO Collaborating Center in Chronic Diseases collaborates with the Global Burden of Disease Project (University of Washington, Seattle), conducting assessments of global health, with a focus on chronic non-communicable diseases and most recent participation also in diseases transferable. The TeleSaúde-RS, has been expanding its international activities: it currently collaborates with the University of Ottawa; it participates in the Brazilian government actions in Mozambique, as well as being host to Australian student participation in this research; 6) LINDA- Brazil, a randomized clinical trial for the prevention of diabetes, is part of a consortium of institutions of Mexico, South Africa and India that explores possibilities of cooperative actions.

Theme 5

Energy of the future, new fuels, non-pollutants and/or recyclable.

Design 5

Background
The Graduate Program in Design has a strong presence in this research theme, highlighting the development of several studies, which resulted in theses, dissertations and publications in the following themes: Analysis of paddles for wind turbines horizontal axis applied to micro power generation; Proposal for a system with application of simulation in the area of wind energy. These studies justify the association of the graduate program with this theme.

Civil Engineering: Construction and Infrastructure 5

Background
The following activities of research justify the participation in this research theme: The Laboratory of paving (LAPAV) of the graduate program has held international cooperation with the Transportation Engineering Center at the University of Nottingham, Britain. The focus of this collaboration is the theme of abstraction of energy (Energy Harvesting) on roads, which can contribute to reduce the urban heat island effect (UHI), and produce energy for residents living in low traffic roads in rural areas. Prof. Jorge Ceratti of LAPAV and Prof. Andrew Dawson (Univ. of Nottingham) organized a workshop for early career researchers from Brazil and Great Britain on this subject, which was funded by the Newton Fund and FAPERGS. The title of the workshop was Pavements for energy harvesting and dependable low-volume roads, the same being conducted between days 16 and 20 May 2016. Prof. Luiz Carlos P. da Silva Filho develops actions of international cooperation on issues of sustainable innovations and systems of energy with Dr. Semida de Campos Silveira of the Royal Institute of Technology (KTH) of Sweden. Among the actions undertaken, the realization of visits between faculty members of the two institutions, and the elaboration of proposals for joint research projects.

Electrical Engineering 6

Background
This research theme is related to two areas of concentration of graduate program in electrical engineering: (i) energy and (ii) Control and Automation. The activities in these areas are concentrated on the following topics: - the integration of renewable energy to the national electric system. - Efficiency of renewable sources of energy. - Control and automation of renewable sources of energy - smart grids. - control of processes. Considering the affinity of the researches carried out within the program with the proposed research theme, this justifies the inclusion of the program in this research theme.

PPG Grade in the Quadrennial
Chemistry 7

Background
In this topic, there is research in the area of Artificial photosynthesis, CO2 valorization and thermobatteries, in collaboration with Center for Green Chemistry and Sustainable Development at the University of Nottingham (UK) and the University of Valencia, Catellon and Murcia (Spain), in addition to patents and projects with Petrobras and Braskem. The program highlights research involving international collaboration with the Universidad Nacional de Córdoba, Argentina. A collaboration with Germany to start a research project also using the BESSY II synchrotron facilities in Berlin, focused in the area of new renewable and clean energies. The program also develops scientific collaborations with Germany and Portugal in the development of biotechnological processes for the production of biodiesel, as well as in the preparation of materials from the glycerol, co-product of biodiesel. Recently (2018-2020), a new project was approved on the subject of biodiesel production, derivatives of glycerol and biolubricants with the participation of the University of Victoria, Catellon and Murcia (Spain). In cooperation with the Universidade Pedagógica of Mozambique the program develops projects in collaboration that involves the reuse of natural waste using concepts of nanotechnology for creation of systems with properties in energy storage. In collaboration with the Universidad Nacional de Mar del Plata (Argentina) the program collaborates on preparation and design of polymer networks crisscrossing along the nanoparticles of different nature to its application in supercapacitors. Collaborative research involving new sources of energy involving the application of plasmonic materials to increase the efficiency of processes of generating energy through solar cell is carried out in collaboration with the University of Victoria (Canada) and the Royal Military College (Canada). The program faculty also researches on conversion of energy through solar cells of third generation also in collaboration with the University of Victoria.

PPG Grade in the Quadrennial
Microelectronics 5

Background
Among the research conducted in the PG Microelectronics highlights the development of the latest generation solar cells (dyes, organic and perovskites).

PPG Grade in the Quadrennial
Administration 5

Background
Among the themes addressed in the program research projects the program notes those related to sustainable development in their various perspectives, innovation and competitiveness, and to the training of human resources at a high level, which are investigated in the context of societies and organizations. In this way, the program contributes to the formation of a high level of intellectual capital to engage teachers and students in teaching, research and extension activities that are effectively aligned the research lines of the program and the demands of the country as a whole. In the last three years, the faculty of the program developed international relations with 46 different international institutions, especially in countries such as the United States, France and the United Kingdom. The main activities performed were international missions and research projects with the partner institutions, which resulted in joint publications and exchanges of students and teachers. It should be emphasized that more than 75% of teachers of the program developed research projects in conjunction with institutions at international level in this period. At least 18 students participated in sandwich internships with these partner institutions. The majority of international relations developed over the last three years continues with the respective institutions, which includes the development of new projects and negotiation of dual diploma degrees. In addition, new projects are being developed with universities in countries such as India, China, the United States and Norway.

PPG Grade in the Quadrennial
Applied Mathematics 4

Background
With respect to this Theme, the focus of the program is in mathematical modeling of processes related to the production of renewable energies. Currently, the fuels are still predominantly derived from petroleum and coal combustion, which leads to environmental pollution, emissions of greenhouse gases and problems of energy security. But the growing global demand for energy and economic and environmental constraints have led us to search for renewable sources of energy, such as bioethanol and biodiesel. Biofuels are produced from biomass, i.e., renewable
sources, plant products or compounds of animal origin. As they are biodegradable, they cause less impact to nature. Biomass is a renewable energy source available in great abundance and derived from organic materials. Everything that is capable of carrying out photosynthesis, or its derivative, can be used as biomass. Some examples are the remnants of wood, vegetable oils and urban waste. Many of these fuels can be produced from raw materials biorenewáveis in several ways, including chemical methods, thermochemicals, biological, biochemical and biophysical. The computational simulations with detailed kinetic mechanisms are complicated due to the fact that there are highly reactive radicals and, in general, there is a need to obtain, from these detailed mechanisms, mechanisms corresponding reduced with fewer variables, while maintaining a good level of accuracy and completeness for the desired applications. In this context, the Group in modeling and simulation of Reactive Fluid Dynamics, coordinated by Prof. Álvaro Luiz de Bortoli, has been developing kinetic mechanisms reduced to the combustion of biofuels such as bioethanol and biodiesel. In addition to giving continuity and enhance this research, one of the goals of the program in the specific case of this theme is to create ties with international research laboratories that collaborate with large companies to implement projects of high level in the fields of chemistry, energy engineering, materials and processes. A research center with which we have already had preliminary contacts for such a partnership is the INSA Rouen Normandie, France.

PPG Grade in the Quadrennial
Resources And Environmental Sanitation 6
Background
The program has several lines of research associated to this theme, which include: "Water in agriculture", "Climate and resources", "natural disasters", "Dynamics and modeling of aquifers", "Modeling and simulation physics and mathematics in hydraulics and hydrology", "Planning and water management".

PPG Grade in the Quadrennial
Physics 7
Background
The area of Physics of materials is one of the strengths of the program. Advanced Materials with new properties, are essential to the advancement of research and industrial applications, including in new energies; the program also highlights actions in nanostructures, sustainable development, diversity climate that justifies its actions in this research themes. The graduate program in physics have a history of research and relevant results in superconductors and magnetic materials for generation, transport and storage of energy. Also develops research on solar cells of the latest generation (dyes, organic and perovskites) on new materials to photohydrolysis of water and storage of hydrogen and fuel cells. In the area of magnetic and superconducting materials the program studies materials for generation, transport and storage of energy. There is research and interest in developing research with the University of Grenoble and the Technical University of Denmark (DTU). With Grenoble, the program intends to undertake projects in the area of magnetism, while studies in high temperature superconductors is the subject of research with DTU.

PPG Grade in the Quadrennial
Agribusiness 5
Background
The program performs research activities, training of human resources and international collaboration to justify its actions in this research theme. The graduate program on agribusiness has two lines of research: (a) Analysis of productive chains; and (b) Management and agribusiness organizations. The scope of these lines of research allows have relation with the different research themes of the university PRINT project. In addition, for the near future the program aims to create a new line of research in the bioeconomy and Agribusiness. To meet the research lines, the program has a number of courses adressing relevant research themes, including: Agribusiness: concepts and applications, Nutrition and Health, analysis and evaluation of investment projects, the bioeconomy, productive chains of the Flesh, Productive Settings, construction of knowledge in agribusiness, Sustainable Development, Strategy and Innovation in agribusiness, dynamics of competition in Agro markets, dynamic relationship in the consumer market and Buyer in agribusiness, Environmental Management in agribusiness, Innovation Management in agribusiness chains, Strategic Cost Management, Interdisciplinarity in Teaching and Research in agribusiness, markets and marketing of Agro Products, methodologies of Costs, methods and analyzes the behavior of consumers of food, Planning and Management of production units, quality and certification in agribusiness, seminars in agribusiness.

PPG Grade in the Quadrennial
Materials science 5
Background
This research theme coincides with the permanent lines developed by researchers at the graduate program in Materials Science. Such lines add several researchers who work on different topics within each line. For instance, there are Projects in collaboration (since 2008), with bilateral projects CNPq/Canada and with articles published in collaboration and a scientific mission in January 2018, with the graduate program’s researcher Prof. Mark J. Milk Saints. There are collaboratos with the Canadian researcher Prof. Alex Brolo, from University of Victoria have led to Projects in collaboration (since 2008), with articles published in collaboration. With the Canadian researcher Prof. Georges Sabat - Royal Military College of Canada. Projects in collaboration (since 2012), with projects submitted in

54
bilateral calls Brazil/Switzerland. Scientific mission in Switzerland in 2013. Prof. Mark J. Milk Saints also collaborate with Prof. Michael Graetzel from EPFL - these are research and collaborative projects involving students doing PhD sandwich internships. The graduate program researcher Prof. Katia Bernardo Gusmão collaborates with Prof. Fernando Rey - Institute of Chemical Technology - Polytechnic University of València - ITQ/UPV

PPG  Grade in the Quadrennial
Computing    7  
Background  
The researchers from the Graduate Program in computing work on this research theme through research projects and related activities. There are strong international collaboration through the project coordinated by Prof. Lisandro Granville and Alberto Schaeffer entitled: ProSeG for security in smart grids. The project addressed the design of electrical networks for intelligent and secure, including machine learning algorithms to detect theft of energy. Project in partnership with Austrian Institute of Technology - AIT (Austria).

PPG  Grade in the Quadrennial
Geosciences    7  
Background  
The Graduate Program in Geosciences conducts research of great importance for the development of renewable energy of the future and new fuels. Within its four research areas, several studies are fundamental and serve as reference in Brazil. The Graduate Program in Geosciences has four areas of research: Geochemistry, Paleontology, Marine Geology and stratigraphy. In each of these areas, there are different research groups that already perform actions on the research themes of the PRINT project, highlighted in partnerships with foreign institutions or individual researchers foreigners informally (through research and joint publications), or formally (through formal agreements formally signed between the groups). In the area of Geochemistry, the researchers of the graduate program develop research in partnerships with foreign researchers in four specific lines: Surface geology and Environmental Geochemistry, Geochemistry of Minerals and Rocks, Organic Geochemistry and Petrology, Metallogenia And Geotectônica and isotope geochemistry. Researchers of the program participating in the line of Organic Geochemistry and Petrology develop their research, in partnership with Canadian researchers, Germans, Danish and Australian, focused on energy resources. These studies involve: (a) the study of ShaleGas (shale gas) in several Brazilian sedimentary basins, such as the Paraná (South and Southeast of Brazil), Parnaíba (East), San Francisco (Northeast) and Parecis (North); b) the study of CoalbedMethane (methane related to coal deposit) on deposits of mineral coal existing in Rio Grande do Sul (Morungava, Chico- Lomã, Santa Terezinha) and Santa Catarina; (c) and the conversion of different types of biomass (rice husks, eucalyptus, etc.) and samples of coal into gas and oil.

PPG  Grade in the Quadrennial
Chemical Engineering    6  
Background  
The graduate program in Chemical Engineering has been working towards improving international cooperation in various ways. However, there are points that still need to be further explored: the organization of important events, participation in international committees and entities, receiving awards of international prominence and in cooperation with universities abroad for research. Special attention is being given to the qualification of both students and faculty members, through doctoral sandwich internships, post-doctorate and missions of short duration. In this research theme, the program has been conducting important research in the areas of (i) renewable sources of energy, biogas as fuel from industrial waste and (ii) reduction of chemical kinetics for modeling of turbulent combustion of biofuels.

PPG  Grade in the Quadrennial
Mining Engineering, Metallurgy and Materials    7  
Background  
All areas of concentration of the graduate program in Mining Engineering, Metallurgy and Materials (Manufacturing Processes, Science and Technology of Materials and Mineral Technology, Environmental and extractive metallurgy) have developed over the years numerous projects of scientific and technological research, involving master's theses and doctoral theses on topics renewable energy and alternative fuels. Many of these projects have partnerships with international institutions that receive (or send) students in co-supervision and/or doctorate sandwich internships in exchange projects with resources from international research organizations.

PPG  Grade in the Quadrennial
Mechanical Engineering    6  
Background  
In the context of this research theme, which encompasses future energy, new fuels, including recyclable, the graduate program in mechanical engineering has excelled in the study of problems relating to the storage of energy. There are a number of research projects in this area. The effective use of various forms of clean energy depends on advances in the theme of the storage of energy, including alternatives more efficient and cheaper storage.
Theme 6 – Smart cities, complex urban areas, 4.0 Industry and circular economy

PPG Grade in the Quadrennial
Mechanical Engineering 6

Background
In the context of this research theme, which includes intelligent cities, urbanizations complex, industry 4.0 and sharing economy, the graduate program highlights the partnership established with the group Centrale Supelec (France) for the study of intelligent cities. Participation in this project, together with other initiatives, under the auspices of the program researchers justify the participation of the program in this research theme.

PPG Grade in the Quadrennial
Computing 7

Background
The researchers from the Graduate Program in computing work on this subject through research projects and related activities:

- Projects conducted by Professor Ana Bazzan, who treat optimization and discovery of patterns in urban data. Partnerships with: UFSP ans UFES (2UEI), but with potential for collaboration with TU Berlin, Humboldt University, Berlin, Vrije Universiteit Brussel.
- Use of computer vision in car cameras shipped: inspection of highways and aid to the driver. Focuses on the use of computer vision to monitor conditions of highways (e.g. detection of recognition of marking the track).
- Electronic Surveillance Project using computer vision. Aims to detect, track and identify behaviors of people from monitoring cameras in the context of electronic surveillance. Partnerships with: University of Pennsylvania and UFPEL, but with potential for collaboration with UCSD.
- BioTope project led by Prof. Dante Barone related to the study, analysis and development of techniques of Artificial Intelligence, in the development of facilitation services in Smart Cities. Partnerships with Univ. Aalto, Finland.
- Project led by Prof. Marcus Ritt: "New methods for optimization of production lines". Partnerships with Universitat Politècnica de València - UPV (Spain), and with the potential for collaboration with ULB (Belgium).
- Collaboration with the LIP/ENSL, Lyon, France, 2013-17, by Prof. Claudio Geyer in co-supervision of doctoral student in the area of frameworks for Big Data, producing several international articles and applications in the area of Smart Cities.
- Collaboration with the University of Coimbra, Portugal, by Prof. Claudio Geyer in co-supervision of doctoral student in the area of Ubicomp And IoT - Wireless Sensor Networks; applications in the area of Smart Cities.
- Co-operation led by Prof. Claudio Geyer (2016-current) in the area of frameworks for Big Data Streaming capability in the context of cloud applications - FOG. Collaboration with Team Avalon, LIP/ ENSL, Lyon, France; prof. Marcos Assunção.
- Co-operation led by Prof. Claudio Geyer in the area of architecture and tools for applications in the area of Smart Cities considering the Big Data technologies, fog, Cloud and IoT; collaboration with Grenoble, France.

PPG Grade in the Quadrennial
Electrical Engineering 6

Background
This theme fits in one of the areas of concentration of PPGEE: Control and Automation. The activities in this area focuses on the following topics: - communication protocols for industry 4.0. - automation systems for intelligent cities. - Integration smart grids - intelligent cities. - cooperative and autonomous robotics. The affinity of the researches carried out with the proposed theme justifies the inclusion of PPGEE this theme.

PPG Grade in the Quadrennial
Civil Engineering: Construction and Infrastructure 5

Background
The following activities of research justify the participation in this theme: professors L.C.P. da Silva Filho and C. S. Ten Caten: academic collaboration with CENIT, a research center hold by the Government of Cataluña and the Universitat Politècnica de Cataluña (UPC). In 2018 a Seminar on Urban Mobility will be held. Professors L.C.P. da Silva Filho and C.S. Ten Caten maintains academic collaboration on the topic Smart Cities and Systems with the Fraunhofer Institute, Germany. Professors Patricia Tzortzopoulos (Univ. of Huddersfield) and Carlos Formoso (PPGCI) organized the workshop Researcher Links, funded by Newton Fund and FAPERGS, focusing on the management of complex urban projects, particularly those of social interest. This workshop had as objective the training of 16 Early Career Researchers. Professor Carlos Formoso maintains intense academic collaboration with the Department of Civil and Environmental Engineering from the University of California, Berkeley. Students of the UFRGS performed their stage of sandwich doctorate at this university which resulted in projects of joint research and publication of articles. The focus of research has been the development of methods and advanced models of management, with a focus on the supply chain, which are strongly supported with the use of information technologies, such as BIM and discrete event simulation. Prof. Carlos Formoso maintains an academic cooperation with Prof. Geoffrey Shen, the Hong Kong Polytechnic University (HKPU). Prof. Carlos Formoso had the opportunity to visit the
HKPU in January 2015 and in the following year a doctoral student from UFRGS held a sandwich doctorate. The joint research have involved studies using information and communication technologies to improve the performance of prefabricated building systems. Professors Eduardo Isatto and Carlos Formoso have maintained an intense academic collaboration with the research group GEPUC, Chile, coordinated by Prof. Luiz Fernando Alarcon. The cooperation involves joint research, the exchange of students of master's and doctoral degrees, and visiting professors. In 2017, a project financed by CONICYT begun focusing on the development of advanced systems for measuring performance in construction companies.

PPG  Grade in the Quadrennial
Public policies  5

Background
Project "Technologies for governability and criminal investigation: science, policy and social control". Project of international cooperation between teams from the Nucleus of Anthropology and Citizenship of UFRGS and the Center for Social Studies, from the University of Coimbra, Portugal, Coordination: Prof. Claudia Lee Williams Fonseca (PPGAS), Participation: Prof. Patrice Schuch (PPGPP). Cooperation between the NGO Bogotá Como Vamos, the Graduate Program in Public Policy, the Faculty of Law of the University of Santa Maria (FADISMA) and the Instituto Fidedigna. Objective: to develop a comparative research on quality of life and culture of citizenship in Brazilian and Colombian cities. After a visit to the NGO Bogotá Como Vamos, on November 11, 2015, a first application of a shared questionnaire of victimization in the city of Novo Hamburgo was conducted by the Instituto Fidedigna. Participants: Letícia Maria Schabbach (PPGPP), Eduardo Pazinato (Phd Professor of PPGPP and FADISMA), Monica Villegas Carrasqui (NGO Bogotá Como Vamos), Aline Curber (Fidedigna). Agreement in preparation.

PPG  Grade in the Quadrennial
Hydric Resources And Environmental Sanitation  6

Background
The following lines of research of PPGRHSAs are associated to this theme: 2) "Urban Water", 3) "Climate and resources", 4) "Prevention, control, treatment and reuse of wastewater," 5) "treatment and water supply systems for human consumption", 6) "hydrological natural disasters", 10) "Energy in water and alternative systems".

PPG  Grade in the Quadrennial
Performing Arts  4

Background
In relation to Theme 6, at the intersection with theme 8, it is noteworthy the artistic projects in progress, which are the result of a research developed in the Performing Arts that dialogues with a research group of the Visual Arts Graduate Program, articulating research, teaching and extension, promoting social inclusion and diversity, connecting academic knowledge with artistic/cultural production in direct dialog with the community. Besides putting in connection art, urban space, conviviality and citizenship, this line investigates modes of production in the performing arts, related to the perspective of the creative economy and sharing economy.

PPG  Grade in the Quadrennial
Economy  5

Background
The theme 6 deals with topics associated with the process of socioeconomic development in its multiple dimensions and that relate directly to the areas of concentration - Applied Economics and Development Economics - and the respective research lines and research projects associated with the program. In particular, it is worth mentioning research concerning: (i) the economics of sharing and regional and urban economy (Smart cities and Complex urbanisation), and the aspects related to the study of industries and public policies on the economy of creativity and culture and (ii) technological innovation and industrial organization, comprising the study of impacts of the industry 4.0 on production, labor market, consumption patterns, development policies, patterns of financing, etc, justifying the participation of PPG in Economics in this Theme.

PPG  Grade in the Quadrennial
Geography  6

Background
a. Working Group of the CLACSO: "Real estate burglary and counterhegemonic criticism" counts with the participation of 26 researchers from universities of Brazil, Chile, Argentina, Mexico, Colombia and Nicaragua. Examines issues of urban development, financing of the production of urban space and production buildings and socio inequalities resulting from these processes, providing a counter-hegemonic critique of the urbanization process in Latin America in the 21st century. b. Innovation and territorial dynamics: a comparative analysis between Brazil and Portugal (European Union). Project presented to the EDITAL Capes-Fundation for Science and Technology. Participating universities: UFRGS, UFPe and University of Coimbra. This research aims to study the innovation space (Smart cities and innovative, tecnópoles, poles and technological parks) of Brazil and Europe with an emphasis in Portugal. c. Red of Socio Territoriales Observatories of Latin America. Constituted in the context of the Association of Universities of the Group Montevideo (AUGM), comprising observatories of universities affiliated to AUGM and which conduct research and analysis of urban and territorial policies. Participating universities in Brazil, Argentina, Uruguay and
Chile. d. The State and Territory Laboratory - LABETER/CNPq, the academic and scientific goals of the Group has been implemented mainly through three major research projects and training of Master's and Ph.D. students. A future cooperation with the universities of Extremadura and Castilla - La Mancha - Spain and Universidade Nova de Lisboa is in phase of preparation. e. The Research Group in internationalization of border studies have been doing studies from the participation of its members in congresses in Bolivia, China, Russia, France, Belgium, Germany, the United States, Argentina, Uruguay and Colombia. The missions of visiting professors invited from Universidad de Buenos Aires, Universidad Nacional de Colombia, Colegio de la Frontera Norte, Mexico; Arizona State University, the University of Artois and the Université Joseph Fourier, France. Work missions abroad comprised: Argentina (University of Buenos Aires); Uruguay (Universidad de la República); France (Univ. Joseph Fournier in Grenoble Université Artois); Chile (Instituto de Estudios Internacionales INTE, Universidad Arturo Prat, Iquique).

PPG Grade in the Quadrennial
Architecture 5

Background
The program has organized and promoted educational and research activities related to the topics smart cities and complex urbanization, comprised in this theme. We highlight the activities carried out under the agreement with the Institute of Urban Planning and Landscape, University of Technology, TU-Wien, Austria, linked to a joint research project, aiming at the development of urban infrastructure for Porto Alegre to become a Smart City, with a focus on intermodal mobility, public transport and quality of public space. The results achieved so far comprise workshops taught by visiting professor of TU-WIEN, Markus Tomaselli, in Porto Alegre, with participation of Austrian students, as well as workshops in Vienna, with the participation of teachers and students of our program: Design Workshop Small European Multimodal Hubs along the shoreline, which focused on the theme of transport and urban infrastructure in the area of the Gasometer, between the Pier Mauá and the administrative center of Porto Alegre; Design Workshop Urban Infrastructures, which aims at the development of an integrated project for the surroundings of the Bus Station of Porto Alegre, seeking a systematic approach to the concept of smart mobility in Porto Alegre, taught in Porto Alegre; and International workshops of projects Wiener Kaiserschnitt and Karlsplatz Vienna Revisited. Everyday tourism and Policy Innovation, both in Vienna. In a complementary manner, it is important to mention the objectives pursued in the context of the covenant with the Phd Program in Architecture, Faculty of Architecture, Planning and Design, Universidad Nacional de Rosario (DARQ-FAPyD/UNR), Argentina. Through this partnership, a joint research project was issued, centered on the modern and contemporary architecture in Argentina and Brazil, taking the city as a problem articulator, focused according to different angles (architecture, city and territory; technique, architecture and city; VILLA, architecture and city; education, health, architecture and city; Aesthetic and vanguards).

PPG Grade in the Quadrennial
Urban and Regional Planning 6

Background
The Graduate Program in Urban and Regional Planning (PROPUR) carries out teaching and research activities directly associated with the aggregator theme. The PROPUR has cooperation in research on complex urban areas with the United Kingdom, more specifically with the Center of Advanced Spatial Analysis (CASA), University College London with which there were exchanges of students and the post-doc of Prof. Romulo Krafta. This professor also maintains contact with the Santa Fe Institute in New Mexico and with the Center for Urban Science and Progress of New York University. Professor Clarice Maraschin held a post-doc studies at the College of Architecture from Texas A&M University, under the supervision of Dr. Cecilia Giusti, which was performed with the signing of the cooperation agreement between the College of Architecture from Texas A&M University and UFRGS. Prof. Livia Islands Piccinini is a partner and the main translator authorised for the english work on complexity Nikos Salingaros, University of Texas, San Antonio. In this same direction of complex thinking and economy 4.0, Prof. Paulo Reyes participates in an international network of research coordinated by Prof. Dr. FLAVIAN Celaschi of Bologna University, with the realisation of five international congresses. Prof. Dr. Julio Vargas held its sandwich doctorate at the University of Washington, in the area of transport systems, under the supervision of Prof. Anne Vernez MOUDON and currently has established a research with the TRAC - Washington State Transportation Research Center. Prof. Eber Marzulo has academic collaboration with the Universidade do Minho (Portugal).

PPG Grade in the Quadrennial
Design 5

Background
The Graduate Program in Design has a strong presence in this aggregator theme. We highlight the development of several studies, which resulted in theses, dissertations and publications in the following topics: Contribution in the Area of Sustainable Innovation of Porto Alegre (ZISPOA) for collaborative projects focused on cities. These surveys, linked to the development of regions of sustainable innovation at Porto Alegre and region, justifies the presence of the Design Graduate Program in this theme.

PPG Grade in the Quadrennial
Epidemiology 6
Background
The PPG-Epidemiology, account with approximately 30 professors originated from different areas (Medicine, Dentistry, Pharmacy, Speech, Nutrition, Statistical and Anthropology), and graduated over 300 students who are quickly absorbed by the academic or health system markets. Its 10 lines of research cover topics of global importance, focusing on national and international collaborative projects, many of large scale. In the last decade the program has been attracting foreign students as regular students (Uruguay, Angola, Ecuador, Colombia) or for the fulfillment of stages of research as students or newly graduates from foreign graduate programs (United States and England). This multidisciplinary character demonstrates the contributions of the program to this theme. Among the collaborative projects of the PPG-Epidemiology acting within the scope of this them, the very nature of the graduate program, by treating with epidemiology, has a direct relationship with the theme of the complex urban areas and smart cities.

PPG Grade in the Quadrennial
Industrial Engineering 7

Background
On this theme, PPGE3M conducts researches involving transport systems in smart cities and complex urban areas, operations management in industry 4.0, with an emphasis on servitização and customization of products and services, and climate control systems in smart cities. The collaborations involve institutions of Canada, Chile, Colombia, Denmark, United States, Italy and England. The following is a brief description of the activities developed and in progress that justifies the inclusion of PPGE3M in this theme. The PPGE3M maintains contact with the Institute for Transport Studies, University of Leeds, and the Center for Transport Studies, University College London. In previous years, these relationships gave rise to contracts financed through CAPES - British Council agreement and the Public Company for Transport and Movement – (EPTC). Currently, these relationships are maintained through contacts, exchanges of experiences and visits of British researchers. The PPGE3M conducts research with the University of Nottingham (England) on modeling of vehicular emissions and dispersion in urban areas and with the Institute of Urban and Regional Development (IURD) of the University of Berkeley (USA), developing studies on factors that influence the choice for non-motorised modes of transport. The PPGE3M has been developing research in conjunction with the Haskayne School of Business (HSB), the University of Calgary (UofC - Canada). The research topics investigated fall within the large area of Operations Management. The PPGE3M began a partnership with the Copenhagen Business School, involving operations management and customization services. The PPGE3M has established collaboration with the Università degli studi di Bergamo (UnIBG). In the context of such collaboration, opportunities for joint studies in the line of products - Service System (PSS) were identified. The PPGE3M maintains a collaboration with researchers from the Department of Computer Science at the University of Pittsburgh, Pennsylvania, USA. The focus of the collaboration project is a startup that aims to develop an innovative system for automated control of thermal comfort aiming at energy savings.

PPG Grade in the Quadrennial
Mining, Metallurgy and Materials Engineering 7

Background
Research groups of the PPGE3M have carried out intense work on environmental technology, in particular, giving support to communities so that they can operate with greater sustainability, equating problems connected with the supply and treatment of water used and treatment of waste, effluents and emissions resulting from industrial and urban activity. Many of these projects involve national partnerships and other international organizations, seeking to gather capacitacions in search of effective solutions for the most diverse problems.

PPG Grade in the Quadrennial
Microelectronics 5

Background
The concept of smart cities and urbanization of the future includes the safe and efficient management of transport modes. This management goes far beyond the organization of the size of fleets and departure times and exit of vehicles. In a complex mesh of transport, as is the case at large metropolises, it is of extreme importance intelligent vehicles possessing knowledge of the environment that surround them and the positioning of other vehicles, to be able to move around with efficiency and safety. Various external elements, however, can affect the circuits of these systems and cause failures, which can lead to errors. This type of failures are usually rare, but given the exponential increase in the number of automated vehicles, the probability of one of them have a failure also increases exponentially. In addition, an error in an automated vehicle is capable of causing an accident involving several other vehicles, causing a general catastrophe in the transport system. The work of the PGMICRO in the area of tolerance have also focused on this type of application. In addition, the PGMICRO also works in the area of energy efficiency of circuits, which is essential for the application on large scale of smart cities concepts. Contemporary digital circuits can consume a lot of energy, therefore an exacerbated digitalization of urban systems can cause a huge increase in energy consumption of cities in the near future. The work developed with this target are essential for cities' sustainable development. Some integrated circuits developed or under development at PGMICRO aim to use wireless sensor networks, internet of things and intelligent maintenance. Thus, the PGMICRO contributes for the development of technologies that have a high potential for application in scenarios of smart cities and industry 4.0.
**Background**

In relation to the complex issue of urbanisation and urban conflicts, in different periods and regions, from prehistoric times to the present, are quite exploited by professors and students of the PPGH, characterized by agreements as CAPES-Cofecub and international publications (articles, books and book chapters compilations), post-doc programs, Senior Internships, doctorate sandwiches and work missions. In the same sense, the PPGH also has consolidated a practice that promotes its international ambience and reinforces academic networks: to offer both disciplines taught by professors of the Program and by foreign invited professors. Some examples enforced in the last quadrennium and linked with this theme are: Discipline "Political history: new objects, new perspectives", taught by doctors Benito Schmidt (PPGH) and Jordi Channel Morell (EHESS, by means of the CNPq support for Visiting Professor), in 2014; - Discipline "Characteristics del proceso de emergencia of indigenous movements in Latin America: the demands of collective autonomies y Derechos del pueblo Mapuche", taught by doctors Augusto Samaniego (University of Santiago of Chile - Usach - invited under the mobility program of AUGM) and Eduardo Neumann (PPGH-UFRGS), in 2015; - Discipline "Metamorphoses of French society in the industrial era: elements for a history of social protection in France", taught by doctors Michel Pigenet (Université Paris I) and Carla Brandalise (PPGH-UFRGS), in 2016; - Discipline "of the archeological language to the historical narrative - the average Syrian Euphrates Archaeological Project (PAMES): the site of Tell el-Abu al-"atîq", taught by doctors Francisco Caramel and Maria Helena Trinity Lopes (Center of History d'Short and d'Além-Mar Faculty of Social Sciences and Humanities - Universidade Nova de Lisboa), Anderson Vargas and Kátia Pozzer (PPGH-UFRGS), in 2016; - Discipline "Portuguese and Africans in the context of the opening of the Atlantic: XV-XVII centuries", taught by doctors John Marinho dos Santos (University of Coimbra) and Joseph Rivair Macedo (PPGH-UFRGS), in 2016.

**PPG Grade in the Quadrennial**

**Physics**

7

**Background**

The PPGFis has a history of relevant results on this research theme. Among them we emphasize: (i) Project "green" house comprising various technologies of industries 4.0 implemented. Development of new materials for industries 4.0. (ii) Development of models in partnership with the Federal Police to help the inhibition of organized crime networks. In addition to these, it stands out its leadership in research on advanced materials, indispensable for the advancement of this theme. The Physics of materials is one of the strengths of PPGFis, developing advanced materials with new properties, indispensable for the integrated advance of science.

**PPG Grade in the Quadrennial**

**Social Anthropology**

7

**Background**

In this theme the PPGAS account with the Nuce - Center for Studies in art and life-styles: studying the different modes and styles of life in society. NUCE is dedicated to the study of practices and cultural manifestations related to cultural diversity, to the so called popular culture(s), the more immediate means of social differentiation active in our society, the construction of sensitivities related to art, the ethnomusicology and performance. PPGAS also posses the Gaep - Group of anthropology, economics and politics: that brings together teachers and students (undergraduate, master's and ph.d. students) involved with research on the social dynamics and the cultural logics pertaining to the economy and the policy, comprising as one of its purposes the articulation among these fields from the anthropological perspective.

**Theme 7**

**Theme 7 – Research on agriculture, supply chain and food safety**

**PPG Grade in the Quadrennial**

**Epidemiology**

6

**Background**

The PPG-Epidemiology, counts approximately 30 faculty originated from different areas (medicine, dentistry, pharmacy, speech, nutrition, statistical and Anthropology), and graduated over 300 students who are successfully find academic placement or in the health system. The program has 10 lines of research that cover topics of global importance, focusing on national and international collaborative projects, many with large companies partnerships. In the last decade the program has been attracting foreign students from Uruguay, Angola, Ecuador, Colombia, for the realisation of research visits and support newly graduates for post-graduate studies abroad (United States and England). This multidisciplinary character demonstrates the contributions of the program to this research theme. These program actions include: the research project ELSA-RS leads a partnership with the University of Cambridge via Interconnect, a project for completion of meta-analysis with individual data on nutrition, diabetes and obesity. The mechanism of work is innovative, not involving the sending of individual data of participants to the pool. The program
also has an effective collaboration in nutritional epidemiology with School of Public Health, Johns Hopkins University. The program also has several other projects, partnerships and initiatives including partnerships with the University Paris-Descartes.

PPG Grade in the Quadrennial
Administration 5
Background
Among the themes addressed in the projects the program fosters research on sustainable development in their various perspectives, innovation and competitiveness, and to the training of human resources at a high level, which are investigated in the context of societies and organizations. In this way, the program contributes to the formation of a high level of intellectual capital to engage faculty and students in teaching, research and extension activities that are effectively aligned to program research and the demands of the country as a whole. In the last three years, the faculty of the program developed international relations with 46 different international institutions, especially in countries such as the United States, France and the United Kingdom. The main activities performed were international missions and research projects with the partner institutions, which resulted in joint publications and exchanges of students and teachers. It should be emphasized that more than 75% of the program faculty developed research projects in conjunction with institutions at international level in this period. At least 18 students participated in a sandwich internship with these partner institutions. The majority of international relations developed over the last three years continues with the respective institutions, which includes the development of new projects and negotiation towards dual diploma degrees. In addition, new projects are being developed with universities in countries such as India, China, the United States and Norway.

PPG Grade in the Quadrennial
Biological Sciences (Physiology) 5
Background
The program has several collaborations in this research theme. Collaboration with Institute of Marine and Environmental Technology (IMET), the Center for Environmental Sciences at the University of Maryland University of Maryland - Center for Environmental Sciences, UMCES). Prof. A.S. Vinegar received financial support for a short-term mission to Baltimore in 2012, where she established the first contact with the IMET program. This visit resulted in the collaboration agreement between UFRGS and the IMET program. In June 2013, Prof. Vinegar received a senior scholarship from CAPES, and spent a year doing research on endocrinology, metabolism and pathophysiology of decapods crustaceans in partnership with Dr. Sook J. Chung and Dr. Eric Schott. Since then, the program has kept the partnership to work with two researchers. Dr. Eric Schot also visited the program recently to carry out joint research.

PPG Grade in the Quadrennial
Computing 7
Background
The researchers from the Graduate Program in computing work on this subject through research projects and related activities: for instance, through collaboration with UPMC, Paris, France, by Prof. Claudio Geyer in the form of co-supervision of doctoral students in the area of tolerance in dynamic systems, producing several international articles and applications in precision agriculture. There are International partnerships with:LIP6 of UPMC, Paris, with the research team of Professors Luciana Arantes and Pierre Sens.

PPG Grade in the Quadrennial
Mechanical Engineering 6
Background
In the context of the Research Theme 7, which involves chain of food, agriculture and food security, the graduate program highlights the partnership established with the IRSTEA (France). The IRSTEA is the French Institute for Research in the areas of environment and agriculture, counting with offices in nine cities of French territory. One of the fronts of IRSTEA is the development of equipment for agriculture, a common interest of the program, where there are several research projects. The partnership with the IRSTEA and the importance of research related to new technologies for agriculture justifies the inclusion of the program in this theme.

PPG Grade in the Quadrennial
Mining Engineering, Metallurgy and Materials 7
Background
Particularly in the treatment of water for reuse, the Graduate Program in Mining Engineering, Metallurgy and Materials has acted strongly and, in particular, on the development of technologies for the treatment and reuse of water in offshore platforms for companies in the area of Oil, Gas and Energy. Their expertise in the area has already been recognized by the granting of national awards, including the Best PhD thesis award from CAPES in 2010.
PPG  Grade in the Quadrennial  
Agribusiness  5  

Background  
The program performs research activities, training of human resources and international collaboration that justify its association with this research theme. The agribusiness program has two lines of research: (a) Analysis of productive chains; and (b) Management and agribusiness organizations. The scope of these lines of research allows their products have relation with the different research themes of the PRINT project. In addition, for the foreseeable future the program plans to create a new line of research in bioeconomy and agribusiness which is associated to this research theme. To support the research the program offers courses addressing related research themes. It is worth noting some of these: Agribusiness: concepts and applications, Nutrition and Health, analysis and evaluation of investment projects, the bioeconomy, productive chains of meet, Productive Settings, construction of knowledge in agribusiness, Sustainable Development, Strategy and Innovation in agribusiness, dynamics of competition in Agro markets, dynamic relationship in the consumer market and Buyer in agribusiness, Environmental Management in agribusiness, Innovation Management in agribusiness chains, Strategic Cost Management, Interdisciplinarity in Teaching and Research in agribusiness, markets and marketing of Agro Products, methodologies of Costs, methods and analyzes the behavior of consumers of food, Planning and Management of production units, quality and certification in agribusiness, seminars in agribusiness.

PPG  Grade in the Quadrennial  
Botany  5  

Background  
A significant part of the research activities of the Graduate Program in Botany fall under the theme "Chain of food and agriculture, food security," since there are research activities in the program which focus on species of potential food or with other potential for economic use.

PPG  Grade in the Quadrennial  
Soil Science  6  

Background  
The Program maintains since its origin in 1965 lines of research aimed primarily to the research theme, fostering the development of agriculture in southern Brazil. The Graduate Program in Soil Science had a leadership role in the implementation on the main national programs and studies for the improvement of soil properties and their productive capacity, with emphasis to: a) the Program for Improvement of Fertility of Soils of the State of Rio Grande do Sul; (b) preparation of tables of fertilizer and lime recommendation for main crops of Rio Grande do Sul and Santa Catarina; (c) in soil microbiology, integration with the Fundação Estadual de Pesquisa Agropecuária, faculty of the program conducted research in nitrogen fixation and technological development of inoculants for vegetables (legumenous plants); d) the impact of the use and management systems on the dynamics of organic matter in soils, contributing to the advancement in understanding the impact of uses and management for the sustainability of agriculture in tropical and subtropical regions.

PPG  Grade in the Quadrennial  
Psychology  7  

Background  
The Graduate Program in Psychology carries out research and teaching activities in four main lines, which are related to the this research theme. The lines are summarized as follows: 1) Assessment and measures in Psychology (projects that aim to develop, adapt and produce evidence of validity and reliability of assessment tools in psychology and related areas); 2) Human Development (Research of the processes involved in the changes and stabilities (cognitive, emotional, social, behavioral) in psychological and psychiatric disorders, neurological and physical health conditions; 3) Health, Prevention and Intervention (development of psychotherapeutic modalities of treatment and community interventions and social); and 4) Cognitive Neuroscience and Behavioral (translational research of prevention, treatment and rehabilitation with instruments of psychophysiology and neuroimaging, electroencephalography, in combination with behavioral tasks and psychological instruments).

PPG  Grade in the Quadrennial  
Food Science and Technology  5  

Background  
Through the research projects developed by faculty of the program evidences a history of collaborations and exchanges with institutions abroad that demonstrate the effective performance of the program on this theme. Essentially, all projects developed in the program can be framed in this great theme, because it deals with issues related to the research lines for quality of food and processes in food. These projects addressing issues associated with the development of innovative methodologies for processing, preservation and quality control of food, in order to guarantee the supply of safe food for the population. In addition, many of these projects are related to the use of agro-industrial wastes and by-products as a basis for the development of processes or generation of inputs with application in the food production chain.
PPG Grade in the Quadrennial Ecology 6

Background

The program acts in this research theme through the Environmental observatory in Food Security and Nutrition - OBSSAN - this observatory is developed by the Center for Studies on Food and Nutritional Security - NESAN, created in 2009. The OBSSAN is a platform (www.ufrrs.br/obssan) which aims to organise and provide indicators in the municipalities of the state of Rio Grande do Sul to the development of researches and as a tool for monitoring the policy of SAN. He adds the dimension peoples and traditional communities to the dimensions proposed by the National Plan for Food and Nutritional Security, seeking to highlight the condition of vulnerability that these groups have suffered. The NESAN is acting in partnership with the WHO Collaborating Center for School Supply (CECANE), next to the Department of Nutrition, aiming at the consolidation of central power, biodiversity and Agroecology, under the CISADE. The Center is being consolidated with the financial support of the Project Mtcic/CNPq along to Latin America Mexico, Costa Rica, Bolivia and Uruguay.

PPG Grade in the Quadrennial Agricultural Microbiology and the Environment 5

Background

The program operates in conjunction with teachers from the Institute of Institute of Food Science and Technology (ICTA) and Faculty of Veterinary Medicine/UFRGS, and with the Department of Microbiology of the Federal University of Health Sciences in Porto Alegre aiming to identify Enterococcus sp resistant to antimicrobials isolated from food samples. These microorganisms can also be found in foods, which have a beneficial role during the maturation of certain products fermented or play an important role as a reservoir of virulence genes and resistance through the food chain for human beings. Aiming at the development and integration of new technologies, the program works in partnership with the Università di Sassari, Italy studying with enterococci isolated from various environments. The program also houses research on studies with enterococci in marine animals. The program has partnerships in research Prof. Dr. Michael Gilmore from Harvard University, who is the leading researcher in enterococci and is currently studying also the presence of enterococci in wild animals. This partnership aims at the integration of new technologies for the study of enterococci from animals in the wild. For the year 2018, we will apply for a program at Harvard University, the Lemann Brazil Research Fund which fosters the cooperation of students and student exchange. Still aiming at the development and integration of new technologies in 2016, we began a collaboration at the University of Trás-os Montes and Alto Douro in Porto, Portugal. The growing number of cases of resistance to human pathogens and agricultural impacts both the public and private sectors of society being responsible for a large number of hospitalizations and deaths, in addition to extensive financial loss for the country. In this way, the development of knowledge in this area is of essential importance to lead Brazil to a new paradigm of socio-economic development. The projects that have been developed by our group focus on the training of human resources with diversity and ability required that the demand area is chemical and/or microbiological reflecting the multidisciplinarity of the group for the incremental processing of synthetic substances aiming for the development of new products with clinical applications and the development of new agricultural technologies.

PPG Grade in the Quadrennial Industrial Engineering 7

Background

This theme, contemplating the chain of Food, Agriculture and Food Security, the program develops researches on topics of sensometry applied to food and systematic for fraud detection in food products. The collaborations involve institutions in the United States and France. The following is a brief description of the activities developed, justifying the inclusion of program in this theme. The program maintains a cooperation agreement with the Ecole Nationale d'ingénieurs des Techniques des Industries Agricoles et Alimentaires de Nantes, developing research in the area of sensometry applied to the area of food. Prof. Michel Anzanello develops research activities in partnership with prof. Chaovilaitwongse (University of Arkansas, USA). The research focus on systematic proposition for the selection of spectral variables with views to the detection of fraud in food products and pharmaceuticals. Studies on the same
topic are also being developed in partnership with Prof. Jean-Pierre Gauchi, of the National Institute for Agricultural Research, France.

PPG  Grade in the Quadrennial
Veterinary Sciences       6

Background
The two areas of concentration of PPGCV (Preventive Veterinary Medicine and pathology; Morphology, Surgery and Animal Reproduction) are perfectly aligned to the concept of food security. Both in terms of the quantitative aspect, as well as to the qualitative aspect of the production of food of animal origin. During the last few years, the Graduate Program in Veterinary Sciences (PPGCV) has developed several research projects involving issues such as the development of nutritional strategies and management in optimizing processes and improving performance in pigs, the diagnosis of diseases that affect domestic animals, production, the study of the biology of pathogens associated with animals and characterization of proteins of the cattle (bovine) tick Rhipicephalus (Boophilus) microplus to identify targets for control. The different groups with whom we have interactions have similar methodologies and complementary to those used in the research groups belonging to program, which harmonizes the optimization of research results. In terms of international collaborations, the the program has established strong collaborations with groups of North and South America, Europe, Asia and Africa. Partnerships with South American groups, projects funded by CAPES, CNPq and UDELAR has allowed Brazilian students and Uruguayan researchers to perform various visits in the laboratories of both countries. The collaborations with European groups results in scientific articles conducted in conjunction with the FLI, Germany, related to nasal tumors in sheep and metaphyseal ossification in classical swine fever. Work with the University of Zurich resulted in the identification of cases of disease of the corpuscle of inclusion in snakes. Highlighted collaboration with the University of Hokkaido, Japan, is being constructed through joint research. The results of this collaboration were published in 14 articles with authors from both Brazil and Japan and three applications for patents in Brazil. One of these patents called the attention of a company of veterinary vaccines, which is conducting tests to analyze the commercial viability of a vaccine based on proteins characterized in collaboration with the University of Hokkaido. In relation to the african continent, there is collaboration with Uganda, Kenya and Mozambique.

PPG  Grade in the Quadrennial
Chemistry       7

Background
The Graduate Program in Chemistry fosters research on food security by developing several projects in this theme: (i) Project on active and intelligent packaging: the use of sol-gel technology in the encapsulation of additives and (ii) Project on active and intelligent packaging intended for the maintenance of the quality post-production of pasteurized milk. Development of antimicrobial control devices employing commercially available compounds for incorporation into polymers for application of active packaging (which act, e.g. in delaying bacterial decomposition of food) or smart packaging to decomposition or modification of food (food security). This particular theme within this line account with international collaboration of Lund University (Sweden) for the study of developmental processes of polymers with molecular print for application in sensors to be included in packaging and the Kyoto University (Japan) for the synthesis of inorganic materials developed for potential application in devices to be inserted in the packaging. We mention also the deposit of two patents covering on the theme. In the context of food security, there are several scientific publications, internships for doctoral students and scientific missions in the Academy of Sciences of the Czech Republic, and the scientific visits of foreign researchers. In this context, the innovative character is related to the development of methods and/or low cost devices for quantification of arsenic in food (especially in inorganic form in the trivalent oxidation state - highly toxic and carcinogenic). FDA and international supervisory bodies are regulating the maximum level for arsenic in infant foods, rice and apple juice. The indicative of chemical species and their concentration are important for assessing levels of exposure and understand the metabolism of arsenic in human organisms. In collaboration with the Universität Greifswald and with the Institute for Bioengineering and Biosciences (Portugal) have developed collaborative research in the areas of analytical chemistry and electrochemistry and biocatalysis and biosensors, respectively, for the development of electrochemical sensors and biosensors that can be used in the monitoring of the quality of the food between these a biosensor of Bisphenol A and a genosensor for detection of E. coli.

PPG  Grade in the Quadrennial
Zootechny       6

Background
This theme has already been produced 18% of theses (39/220) and 23% of the dissertations (138/603) of the program, as well as the development of 17 projects of interdisciplinary dimension with other PPGs UFRGS and with international centers of excellence for research, development and innovation.

PPG  Grade in the Quadrennial
Social anthropology       7

Background
The program participates in the Group of anthropology of Brazilian Power (Principe), which brings together researchers interested in studying issues relating to social/cultural identities related to food, whereas these are
privileged spaces to apprehend certain processes through which social groups mark its distinction, recognize and are recognized. In other words, the ways in which people and groups construct their social identities.

**PPG Grade in the Quadrennial**

Genetics and Molecular Biology 7

**Background**

In this line of research, have already been developed research projects, coordinated by Prof. M. Margis with national and international funding, which resulted in the publication of articles in conjunction with researchers Dr. Zhiyong Wang, Carnegie Institution/Stanford University, USA; Dr. Christine Foyer, University of Leeds, UK; Dr. Michael Frei, University of Bonn, Germany. In addition, there are signed agreements with the University of Barcelona (Spain), the University of Brussels (Belgium) and the Cornell University (United States) for exchanges of students through stages of doctorate sandwich and visits of short duration.

**PPG Grade in the Quadrennial**

Biological Science (neuroscience) 5

**Background**

The program develops researches about how food behavior is affected by adversity or early stimuli and also as a result of the offering of diets rich in fat or sugars since childhood. The results suggest changes in brain plasticity with diets rich in fat offered chronically. The understanding of these results will provide greater clarity for regulatory agencies and for the population in search of greater food security. In this line, the program has effective collaboration with McGill University, Montreal, Canada.

**PPG Grade in the Quadrennial**

Design 5

**Background**

The Graduate Program in Design has a strong presence in this research theme, highlighting the development of several studies, which resulted in theses, dissertations and publications in the following themes: processes of identification in communities of family farming; systemic approach in vegetable production in the context of family farming. These studies justify the participation of the graduate program in design in this theme.

**PPG Grade in the Quadrennial**

Sociology 7

**Background**

The Group of Studies and Researches, Family Farming and Rural Development - GEPAD research on this theme. In this sense, the program highlights the international achievements of the group on the theme: - Participation in the Special Working Group on Food Security created by the United Nations Organization for Food and Agriculture (FAO-UN), along with the Latin American Council of Social Sciences (CLACSO); - Analysis of the processes of transfer of public policies for Family Farming in Mercosur, a project that is done in partnership with UNILA and Specialized Meeting of Family Farming of Mercosur (REAF-Mercosur); - Analysis of the construction of institutional markets for family farming in Brazil and Colombia, a project that involves cooperation between the UFRGS, National University of Colombia, the Pontificia Universidad Javeriana, the CIRAD-France, and the FAO/UN. - the international cooperation project involving institutions of Brazil, Russia, China, India and South Africa called smelled (BRICS Initiative is Critical Agrarian Studies). The project analyzes articulated way the agrarian and food products on a global scale. - the implementation and organization of the III International Conference on Agriculture in an urbanised society - AgUrb. Through the GEPAD and partnership with the graduate program in Rural Development, in addition to the Interdisciplinary Center in society, Environment and Development (CISADE) and of the Graduate Program in Sociology and the Center for Studies and Research in Agribusiness (CEPAN), was promoted the I WORKSHOP HEALTHY FOODS FOR THE COUNTRYSIDE AND THE CITY, from 31 October and 1 November, Porto Alegre in 2016. The organization of the III AgUrb involves partnerships between different institutions acting in local, national and international levels: a network of articulation formed by a broad forum for organizations interested in participating in the meeting. An International Scientific Committee is composed of a group of international researchers from the agriculture sector involved since the first edition focus on general and conceptual elements. In addition, there is the participation of a National Scientific Committee composed by a group of institutions acting in national food safety that assist the Organizing Committee in the decision-making process.

**PPG Grade in the Quadrennial**

Resources and Environmental Sanitation 6

**Background**

The following lines of research of the graduate program are associated to this theme: 1) "Water in agriculture", 3) "Climate and resources", 6) "natural disasters", hydrological 9) "Dynamics and modeling of aquifers", 12º) "Modeling and simulation physics and mathematics in hydraulics and hydrology", 13) "Planning and water management".

**PPG Grade in the Quadrennial**

Physics 7

**Background**
In this research theme the Graduate Program in Physics develops researches in three major areas: (1) Physics of materials: it is one of the program’s strong points, developing advanced materials with new properties essential for the advancement of integrated science. (2) Biological Physics: techniques for networks theory and simulation are used for data analysis of large-scale gene expression data. In particular, we collaborate with the Institute of Child Cancer (ICI) for the determination of metabolic differences presented by Metastatic Ewing Sarcoma in relation to less advanced versions. The program applies these techniques for the study of several types of cancer of the mouth and diseases of genetic origin as the polycystic kidney disease. The program collaborates with the Department of Genetics, analyzing data from gene expression in studies involving soybeans and rice. (3) Simulation Techniques for active substance. Many living organisms are endowed with the ability to migrate and reorganization, necessary for the development and present in certain illnesses (such as cancer metastasis). The interest is to investigate the possible behaviors of systems formed by many of these agents, which requires the formulation of models that explicitly take the migration activity, as well as the death and proliferation of these systems. Applications range from the development of embryo to the investigation of how metastatic cells form and invade other tissues, or cells of the immune system are capable of an inflammatory response.

PPG  Grade in the Quadrennial  
Geography  6  
Background  
The group on Agrarian Studies (NEAG) and the center of the heritage and culture of wine - CEPAVIN (CEPAVIN) count with the participation of researchers dedicated to the study of agrarian space their social relations, political and economic. Research related to the agrarian reform settlements, the development of agroecology in family farming, to manifestations of social movements of struggle for land, food security are recurring themes of researches developed. The CEPAVIN in turn brings research themes related to wine, wine production, its expansion in the national territory, their relationship with the culture and with the patrimony, its sustainability. These studies develop both at the level of master and doctorate and post-doctorate studies. These are themes of projects financed by CNPq and CAPES.

PPG  Grade in the Quadrennial  
Public policies  5  
Background  
The program highlights an agreement with the Universitat Rovira i Virgili in Tarragona, Spain, with which research is developed, study visits and joint publications about cultural heritage, food and tourism are carried out. Special emphasis is given to the project on The Paths of the “Rancho”: networks and flows around the food distribution by the Food Acquisition Program (EAP) and the Zero Hunger Program (PFZ) in the city of Porto Alegre, approved in the edital MCTI-CNPqMDS-SAGI No. 24/2013 - SOCIAL DEVELOPMENT. The project aims to investigate the process of distribution and consumption of foods through the Zero Hunger Program (PFZ) and the Program for purchase of food (PAA) and community kitchens (CC) and its impact on the communities concerned, building a field of knowledge for critical reflection about the structuring and expansion of government programs geared to the policy of Food and Nutritional Security. Another set of actions is developed in the context of public policies with indigenous communities. These actions, sometimes come attached to health policies, such as the project "Indians in URBANITY: reconstructing the history and the village of people plow in Porto Alegre" and the study on the guarani indigenous collective and access to public policies and citizenship rights in the Southern Cone, carried out in partnership with the Federal Public Ministry (6th House - Brasilia), the Universidade Católica Dom Bosco (BR), UNICAMP (NEPO), Universidad Nacional de Misiones (AIR) and Universidad Católica de Asunción (PY), under the patronage of the Agencia Española de Cooperación Internacional para el Desarrollo.

PPG  Grade in the Quadrennial  
Chemical Engineering  6  
Background  
The graduate program in chemical engineering has fostered international cooperation in various ways. However, there are points that still need to be further developed: the organization of important events, participation in international committees and entities, receiving awards of international prominence and in cooperation with universities abroad for research. Special attention is being given to the qualification of both students and faculty, through doctorate sandwich internships, post-doctorates and missions of short duration. In this research theme, the program has been conducting important research in the areas of (i) the use of the electric field in food processing, (ii) reuse of agro-industrial wastes and (iii) the development of new products for the food industry. These justify the inclusion ans association of the program with this research theme.

PPG  Grade in the Quadrennial  
Molecular and cellular biology  7  
Background  
In this research theme, the Graduate Program in Molecular and Cellular Biology researches on the following topics: modelling of food cultivars or templates for improvement of food varieties; development of potential biological control agents for the attack to the Arthropods-pest; characterization of new gene clusters responsible for the production of bioactive compounds; development of innovative systems for food preservation, aiming at improving food security;
identification of mechanisms of absorption and transport of nutrients in plants, including the essential elements for human nutrition and/or toxic elements, both for edible tissues.

**PPG Grade in the Quadrennial**

**Crop Production 5**

**Background**

The program acts directly in the area of agriculture, conducting research projects that aim to increase the productivity of agricultural crops, reducing the use of external inputs and of the environmental impacts of agricultural activity and increase the sustainability of productive systems of food and financial return to the rural producer, ensuring also the social sustainability of production system. Several lines of research are related to the chain of food and agriculture and food security. In general, the crops covered are grain-producing crops (corn, wheat, soybeans, oats, rice, fruit and vegetables. Furthermore, the research with these species seek to meet the regularity of production, quality and quantity of food, allied to the reduction and optimization of productive inputs, as well as take into account social aspects, since the farmer also participates in the research, and many times, the agent developers in the area of study.

In this sense, the research has focused on the reduction of external inputs to the system, which can also be considered as sustainable production, and knowledge of phytotechnical aspects that can contribute to the production becomes less affected by climatic 'contingencies', for example. In this line, studies are developed in the area of irrigation management, management of nitrogen, protected environment, suitable substrates for each system and culture, the use of alternative products to control with the use of chemicals (for example, with the use of essential oils, organic products, resistance inducers, microelements), systems of crop rotation, among others. Also the area of Plant Health contributes with this line, especially as regards food security, whereas acts directly in the search for solutions to problems related to losses arising from the action of insects, mites and diseases, more rational and safe. It is increasingly necessary to use technologies that provide minimal impact to the environment and to human health. Thus, technologies such as tillage, crop-livestock integration-forest, integrated management of pests, diseases, weeds and crop rotation are researched, developed, perfected and disseminated by teachers and graduates of the program. These technologies, if properly managed, contribute to increase the productivity of crops and for the reduction of production costs.

**Theme 8**

**Theme 8 – Education of high level human resources for activities in strategic areas**

**PPG Grade in the Quadriennial**

**Ecology 6**

**Background**

Within the scope of this great theme, the Graduate Program in Ecology has invested in the training of our students by means of international courses and workshops, seeking theoretical advances and development of learning tools in different areas of knowledge in Theoretical and Applied Ecology. We believe that, with a greater and more effective interaction with other Graduate Programs, we can propose courses and workshops that aim at more connected, multidisciplinary, and which respond to new challenges, able to enable researchers and students to propose actions towards sustainable socio-economic development. Considering these lines, it is important to highlight the involvement of the Program with the IMAE (International Master in Applied Ecology), an Erasmus Mundus program, where students from different countries carry out part of their masters (all data collection and writing of their dissertations, as well as the realization of disciplines) under the guidance of our faculty. This program also includes the Graduate Programs in Botany and Animal Biology from UFRGS. Students are highly qualified and selected by an international committee, involving the European partner universities (University of East Anglia, United Kingdom; Universität Kiel, Germany; Université de Poitiers, France, University of Coimbra, Portugal) and UFRGS. The PPG- Ecology has already received 9 international students, all with excellent performance, and many of them are now in foreign institutions doing their theses and are thus potential bridges for the establishment of new relations.

**PPG Grade in the Quadriennial**

**Electrical Engineering 6**

**Background**

The education of human resources of high level (notably of master and doctorate students), focused on qualified performance both in academia and in various industrial segments constitutes one of the central goals of PPGEE. The program shares the responsibility to train human resources with the necessary diversity, enabling incremental and cultural transformations, who are able to lead Brazil to a new paradigm of socio-economic development, aggregating knowledge in all sectors of society. Thus, the program fits well in this theme.

**PPG Grade in the Quadriennial**

**Epidemiology 6**

**Background**


67
The PPG-Epidemiology, has approximately 30 advisors from different subject areas (medicine, dentistry, pharmacy, speech, nutrition, statistical and Anthropology), and has graduated over 300 students who are quickly hired by academic institutions and health system companies. Its 10 lines of research cover topics of global importance, focusing on national and international collaborative projects, with many large companies. In the last decade it has been attracting foreign students as regular students (from Uruguay, Angola, Ecuador, Colombia). It also offers research internships abroad for students and offers post-graduate studies abroad (in the United States and England). The program multidisciplinary character demonstrates the contributions of the program towards this research theme. Among the action in this them we can mention: a recent partnership led by ELSA-RS (Longitudinal Study of Adult Health) with the University of Manchester (UK), in order to research mental health studies in large urban areas (in the headquarters of the ELSA-Brazil). The activities foster, in addition to the organisation of national and international seminars, also provide data for the research groups.

We also further encourage the formation of foreign students, expanding the dissemination of the graduate program and the opportunities for carrying out the studies in the English language. The program receive faculty and researchers with diverse expertise to advance the implementation of methods and knowledge in the context of the graduate program in epidemiology and its partners, supporting visiting professors or faculty collaborators.

The program provides opportunities for faculty and students carry out activities summer/winter schools, missions of short duration, participation in congresses of international relevance, PhD sandwich opportunities, post-doctorate abroad). The program also aims to expand the number of courses offered in English, to expand and qualify the mechanisms to facilitate communication between partners and to qualify the teaching activities.

**PPG Grade in the Quadrennial**

Phytotechy  5

**Background**

The Graduate program in Phytotechny has held a series of activities of academic and scientific exchanges with public and private institutions, both in the country and abroad. These partnerships supported the qualification of many students and, in several cases, also supported post-graduate courses, through the exchange of faculty and co-supervision of students and development of joint scientific works. There is a growing number of partnerships with official entities, such as with Embrapa, mainly in the area of genetics, Agronomy and Crop Plants. The faculty of the Phytotechny Program have incremented the exchanges with institutions abroad, among them: Germany and Israel - University of Kassel - Volcani (Israel) on the use of meteorological networks agro for the improvement of agro ecosystems; With Argentina: exchange with INTA and its experimental stations and joint development of varieties of cereals in the cold season. With Canada: Agriculture and Agrifood Canada - Winnipeg, Manitona. Academic Exchanges: with Spain, the Universidad Politécnica de Valencia on Cultural academic exchange of genetic material and support for teacher training. With the USA: University of Louisiana on the exchange of genetic material of oats; With University of Minnesota: Exchange and development of cultivars of oats; joint research in epidemiology of pathogens (population dynamics and virulence of Puccinia coronata and Gibberella zeae); with the University of Florida - Exchange of genetic material of oats; with Texas Tech University - Exchange of pupils and students. With Mexico - Colegio de Post-Graduados of México-Texcoco on Academic Exchange and exchange of materials; with Uruguay: Montevideo Group, studying the climate variability of southwestern South America and its applications to agriculture; with Argentina: Several Universities and Working groups and exchange of experiences in monitoring of weather and climate, with views to the planning and monitoring of agricultural harvests; With Italy: Bologna University, for exchange of students and researchers; With the International Research Institute for Climate and Society: Exchange of research; with Portugal: Project Coordination Bartolomeu de Gusmão at the Instituto Politécnico de Beja; with Costa Rica: Center for Research in cell biology and molecular of Costa Rica, San José. The Vegitrade Project, involving Brazil and nine countries: World Center of food preservation.

**PPG Grade in the Quadrennial**

Social Anthropology  7

**Background**

This is the theme that has greater proximity with the activities of graduate program, to the extent that it complements the research areas/nuclei of the program. The following research core areas develop activities related to this line: - NACL - Nucleus of Anthropology and Citizenship: aims to perform a critical analysis of the notions of citizenship and justice in their intersections with the production of social life. It takes as its object of study laws and new "rights", as well as projects and programs of intervention between popular groups urban, rural and ethnic minorities. - NER - Center for Studies of Religion: Catholicism, Protestantism, medMINIC religions and other segments of the religious field are studied in its multiple and complex associations with modernity and globalisation, on topics such as politics, transnationalization, social movements, life styles and forms of sociability urban areas, as well as the social dynamics related to the classical problem of secularism and secularization.
PPG Grade in the Quadrennial
Political Science 5

Background
The graduate program in political science has formed high level human resources for over four decades. Several of its graduates were absorbed by teaching and research institutions. The research conducted in the Program tackles different dimensions of political phenomena (institutional, international, cultural, and theoretical); in addition to contributing to the advancement of scientific knowledge it offers instruments to qualify the public debate and inform policy makers. The consolidation and extension of international research networks will bring benefits to both the formation of human resources of high level as well as for the production of innovative knowledge and extra impact site. The insertion of a larger number of students in international networks of research and their interaction with researchers/teachers visitors in the program and in institutions abroad (via missions of short duration and doctorate sandwich abroad) will be a great asset value for the education/training of students. Such experiences enable advanced training in themes, theories and methodologies and experimentation of new experiences of other models at the university. In this aspect, the program prioritized foreign institutions committed to the formation of researchers capable of analysing issues and formulate policies in favor of development and generation of knowledge to society. The internationalisation of the program through research networks will result in an increase in the production of original knowledge and, in particular, the higher projection/repercussion of its production (articles, books, chapters, working papers, theses and dissertations). Increasing the international visibility of the production of graduate program and their networks should expand its capacity to attract students, teachers and resources from abroad. The convergence of these assets will contribute to transform the Graduate Program in Political Science into an international environment.

PPG Grade in the Quadrennial
Biological Sciences: Pharmacology and Therapeutics 4

Background
At the initial stage of planning and implementation of the activities of the graduate program, academic mobility with interactions with other research groups of UFRGS and external to it, was a priority in the discussions and in the establishment of program’s strategies. The program presents qualified interaction with universities and research centers of reference to qualify their activity of educating highly qualified human resources to research. We highlight, among these external interactions, the one with the Drug Discovery program at the University of Nottingham. This interaction provides internships for researchers and students of the program, relying on cooperation which lead to highly qualified academic production. Other projects and international cooperation are performed with: Georgia State University, Pediatric Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, Maryland, USA, University of Toronto in Canada; University of Dallas (USA), Mount Sinai Hospital, New York, United States, Physical Medicine & Rehabilitation, Spaulding Rehabilitation Hospital & Massachusetts General Hospital at Harvard Medical School, Boston, United States; Universität Wien (Univie, Austria), National and Kapodistrian University of Athens (NKUA, Greece), universitaet UNIBAS, Basel (Switzerland), Biomedical Research Foundation - Academy of Athens (BRFAA, Greece), (UNIVIE universitaet Wien, Austria), University of Florida (UF, USA) and Die Universiteit van Oranje Vrystaat (UFS - South Africa); Clinical Hospital of Barcelona, McMaster University, Canada. University of Santiago de Compostela (USC), Spain. The graduate program considers several possibilities of establishing new partnerships and cooperation projects in Brazil and abroad, as well as the strengthening of existing international partnerships, strengthening the areas of health sciences and translational medicine as well as the formation and education of qualified human resources.

PPG Grade in the Quadrennial
Computer Science 7

Background
The researchers from the Graduate Program in computing work on this theme through projects and collaborations:
- Cooperation with the University of Toulouse III, within two projects CAPES/Cofecub. Included stage of post-doctorate and PhD sandwich internships.
- University of Louvain La Neuve, Belgium, in the context of two projects CNPq/Fnrs. Included stage of post-doctorate and phd sandwich.
- Cooperation with INRIA Saclay, Paris, France, in the context of project CNPq/INRIA, including cooperation and research missions abroad (2018-2022),
- City Univerity of London and King's College London. PhD students abroad and former student of UFRGS, currently at Rice University.
- Dual diploma agreements and training of human resources with INPG (Grenoble, France) and ENSEEIHT (Toulouse).
- Cooperation with University of Stuttgart in the scope of the project CAPES - DAAD, titled “Geometric Modeling, deformation and visualization of data sampled a massive, coordinated by Prof. John Comba.
- Project CAPES BRICS: Joint Graduate Program in Cyber Security: Bridging the Cyber and Physical Worlds Through Smart and Secure Management.
- Participation of faculty member by invitation in the prestigious Dagstuhl seminar, Germany.
- Among the partnerships already established can be highlighted: USA: UC San Diego, CAIDA, Texas A&M University, University of Pennsylvania, JPL, NASA, Northeastern University, Rice University, New York University;
- UK: University of Bristol; City, Queen Mary, University of London, Imperial College London, Lancaster University;
- France: inria, University Pierre and Marie Curie, University of Grenoble Alpes;
- Germany: Karlsruhe Institute of Technology, the University of Hanover, University of Stuttgart;
- Netherlands: University of Groningen, TU-Delft;
- Spain: Barcelona Supercomputing, Universitat Politècnica de València - UPV;
- Partnerships in other countries include: Trinity College Dublin, Austrian Institute of Technology (AIT, McMaster University, Halmstad University, University of Oslo, Politecnico di Torino, University of Lugano.
- Among the partnerships with potential for interaction we highlight: USA: UCSD, UC Irvine; UK: University of Sheffield, University of Nottingham, University of Manchester, King's College London; Germany: TU Berlin, Humboldt University, Berlin, University of Munich - TUM; Belgium: Vrije Universiteit Brussel, ULB; Australia: University of Newcastle.

PPG  Grade in the Quadrennial

Agribusiness  5

Background

The program performs research activities, training of human resources and international collaboration to justify its actions in this theme. The agribusiness program has two lines of research: (a) Analysis of productive chains; and (b) Management and agribusiness organizations. The scope of these lines of research allows their products to relate with the different themes of the UFRGS proposal. In addition, for the foreseeable future the agribusiness program should create a new line of research in the bioeconomy, a thematic linked to this theme. To foster these research lines, the program has a list of disciplines which address topics related to themes. It is worth noting some of these subjects: Agribusiness: concepts and applications, Nutrition and Health, analysis and evaluation of investment projects, the bioeconomy, productive chains of the Flesh, Productive Settings, construction of knowledge in agribusiness, Sustainable Development, Strategy and Innovation in agribusiness, dynamics of competition in Agro markets, dynamic relationship in the consumer market and Buyer in agribusiness, Environmental Management in agribusiness, Innovation Management in agribusiness chains, Strategic Cost Management, Interdisciplinarity in Teaching and Research in agribusiness, markets and marketing of Agro Products, methodologies of Costs, methods and analyzes of the behavior of consumers of food, Planning and Management of production units, quality and certification in agribusiness, seminars in agribusiness.

PPG  Grade in the Quadrennial

History  6

Background

With respect to the achievements of the graduate program within the theme of education of high level human resources able to identify and analyze issues of historical character, social, cultural, political and institutional as variables for the sustainable development of Brazil, in order to conceive projects and policies capable of promoting changes in the generation of knowledge for society, this theme presents itself as a central guideline of every action of teaching and research of history graduate program, including their practices of internationalization. In order to exemplify this statement, we highlight actions taken in the last four years: - Co-tutelage with dual diploma the PhD candidate Luiz Felipe Mundim, who defended the thesis "The public organised for the fight. The Theater of the people in France and the resistance of the workers' movement to commercial cinema (1895-1914) / Le Public kapitaga pour la lutte. Le Cinéma du peuple en France et la gare du mouvement ouvrier au cinéma commercial (1895-1914)", under the joint guidance of Professor Carla Brandalise (PPGH-UFRGS) and professor Michel Pigenet (Center d'Histoire sociale du XXe Siècle (CHS) of the Université Paris 1 Panthéon-Sorbonne). The thesis received an honorable mention in the CAPES thesis Award in 2017; - Co-supervision of the master student Wellington Rafael Balem, who completed his dissertation on autobiographies urns of Egypt in the Old Kingdom, guided by Dr Katia Maria palm Pozzer (PPGH-UFRGS) and Dr Maria Helena Lopes (Centro de História d'Aquém e d'Além-Mar da Faculdade de Ciências Sociais e Humanas - Universidade Nova de Lisboa).

PPG  Grade in the Quadrennial

Applied Mathematics  4

Background

The program observes that recently the authorities of the International Mathematical Union promoted Brazil to the Group V of the IMU. This is the excellence level of the mathematics world, until now accessible only to a restricted number of countries with mathematical traditions older than those of Brazil, and whose levels of socio-economic development are already high or are in greater development. A challenge for our country, and especially to our scientists, is to transform this scientific vitality in a catalyst for the advancement of basic education and for the establishment of a knowledge-based society. The program acts significantly in the formation of strategic human resources in the area of applied maths, having in view that masters and doctors in this area can contribute
significantly to the advancement of research in various areas of knowledge, as well as contribute to the improvement of education in the country at all levels.

PPG Grade in the Quadrennial Biological Sciences (neuroscience) 5

Background
The program focuses mainly in the formation of human resources at a high level, having in view the necessary diversity, and enabling for incremental and cultural transformations that are able to lead Brazil to a new paradigm of socioeconomic development, linked to the aggregation of knowledge in all sectors of society. The formation of human resources of high level is a constant concern of the graduate program since its beginning. All faculty members are involved in this goal. To do this, in the context of internationalization, we have promoted courses bringing researchers from foreign universities, in addition to a series of events, such as the Neurosciences Workshop (held every two years, currently in the 10th edition) where we bring international researchers. International Seminars occur with frequency. A visit from a collaborating professor from the USA is scheduled for March 2018, which will participate in lectures and seminars. Over all those years, doctoral candidates have gone to sandwich programs abroad and the faculty has participated in international conferences and visits to research laboratories. Thus, we believe that, from the point of view of internationalization and formation of human resources, there is a participation of virtually all faculty members of the graduate program.

PPG Grade in the Quadrennial Nursing 5

Background
Nursing belongs to the area of Health Sciences. The graduate program at UFRGS is of significant importance in the formation of teachers and researchers in health and nursing in the country, in particular in the context of the Southern Region. It is structured in two areas of research, which cover topics relevant to nursing and health, contributing to the formation of human resources. The program has strong ties of international cooperation with North America, Latin America, Western Europe and Oceania, with growing opportunities and constant qualification of researchers, teachers, and doctoral students who work together within the graduate program.

PPG Grade in the Quadrennial CIVIL ENGINEERING: CONSTRUCTION AND INFRASTRUCTURE 5

Background
The following activities of research justify the participation in the theme: The program has a course titled International Collaborative Construction Management (ICCM), which is administered in conjunction with three other universities: Technion (Israel), Middle-Eastern Technical University (Turkey) and Carnegie-Mellon University (USA). This course is taught entirely in English and its goal is to qualify students of masters and doctoral degrees in the theme of collaboration in international environments. It has already been offered approximately 8 times at UFRGS, and several students of the program have had the opportunity to take the course.

PPG Grade in the Quadrennial Resources and Environmental Sanitation 6

Background
All the lines of research of the program are related to this theme. The integrated approach in dealing with water and environmental issues distinguished the program in its history, both at national and international levels. The program is fully inserted in the process of development of knowledge and training of human resources, both at regional, national and international level. Currently, an increasing number of graduates occupy positions in the municipal, state and federal levels associated with Resources and Environmental Sanitation as, for example, in the National Water Agency (ANA), the National Institute for Space Research (INPE), Petrobras and Embrapa. It is also important to emphasize the increasing participation of private companies as recipients of alumni of the program for the development of projects and the prominent role in other post-graduate courses of students. Some are now in universities such as UNB, USP, UFEB, UFC, UFPR, UFAL, UFPA, UFRN, UFRGS, UFSM, UCS, UFPEL, FURG, UFCG, UNIFEI, UERGS and UFMS. The program receives a significant number of foreign students from Mozambique, Colombia, Peru, Costa Rica, Ecuador, Argentina, Paraguay, Bolivia, Uruguay, France, among other countries, financed by CNPq, CAPES or institutions in their countries of origin. The general objective of the program is the formation of researchers of high qualification at the level of masters and doctoral degrees from solid base of knowledge and development of research in the areas of Water Resources and Environmental Sanitation. Specifically the program has as an objective the training of professionals that meet the demand of qualified higher education in the country regarding both teaching and research. The program meets the growing market demand for highly skilled professionals in addressing problems in the areas of Water and Environmental Sanitation, nationally or internationally.

PPG Grade in the Quadrennial Psychology 7

Background
In this research theme, the Psychology program highlights research projects that contribute directly to the education of future faculty and doctors. This is is done in collaborative projects with Spain and United States (Universidad de
Deusto and Universidad del Pais Vasco, Spain and University of Nebraska - Lincoln, USA). In the context of the theme education of high level human resources, the program, in addition to form masters and PhDs, also develops research and training aimed at professionals who work mainly in the fields of health and education. Among these, we highlight the training offered to teachers of basic education (in its different levels) and professionals in the field of health (for example, couples therapists, psychologists who work with adolescents, among other professionals). The Project on Adaptation, Dissemination and training for implementation of programs directed to Psicoeducation and parenthood in a situation of divorce and marital conflict is also important. The project is an intersection between two lines of research of the Psychology Program. This project is associates to the line of research “Human Development”, which includes studies in developmental psychology covering distinct contexts, cultural aspects, social vulnerabilities and methods of assessment and intervention. In the same way, it is associated to the line of research "Health, Prevention and Intervention", which covers research related to the development of psychotherapeutic modalities of treatment, interventions and psychoeducation.

PPG Grade in the Quadrennial RURAL DEVELOPMENT 6

Background

The program has worked consistently on the internationalization of human resources training. The program internationalization is done by the establishment of exchanges, projects, participation of foreign students as members of the student body, celebration of protocols of intention, as well as publications in conjunction. In recent years the graduate program has developed projects with countries in Europe, Asia and Latin America, among these we highlight: a) France - Center de coopération internationale en recherche agronomique pour le Développement (CIRAD), Le Mans Université, and Université du Maine; b) Netherlands - Wageningen University; (c) China - China Agricultural University; (d) Norway - University of Oslo, and) Argentina - Universidad de Córdoba, Universidad de Entre Rios (UNER); f) Costa Rica: Universidad de Costa Rica. At the same time, the program has sought to expand and consolidate its level of internationalization. The doctoral candidates sandwich exchanges have led our students to very different destinations: Belgium, Spain, Finland, Netherlands, France, China, Norway, Costa Rica, Mexico, Portugal, Italy, England and Canada, to list the countries covered since 2013. The program has also been chosen by many foreign students for their studies. In our student body we have students from Colombia, Costa Rica, Chile, Mozambique, Mexico, Spain, Italy, Benin, Peru, Bolivia, El Salvador, France and Cabo Verde (entrants from 2013 onwards). These exchanges result in signing agreements and/or protocol of intentions, such as the established (and some conducted) with the University of Mexico, Università degli Studi di Perugia, Italy; Universidad de San Simón, Bolivia; Universidad de Valencia, Spain, Universidad de Costa Rica, Costa Rica, Universidad de la Republica, Uruguay, among others. Furthermore, the intense participation of faculty of the program in research activities and international cooperation corroborates and clearly shows the important degree of internationalization that the program presents today.

PPG Grade in the Quadrennial Economics 5

Background

This theme addresses issues associated with the process of socioeconomic development in its multiple dimensions and that relate directly to the program's areas of research - "Applied Economics" and "Development Economics" - research lines and research projects of the Program. In particular, it is worth mentioning the researches around the theoretical and empirical aspects associated with the development of the economy and of the Brazilian society, with particular attention to the study of institutions and policies for the promotion of the development of the interface between the Brazilian economy and the international economy and the financing of development is linked to lines of interest of the program, in that regard, also, to the education of human resources.

PPG Grade in the Quadrennial Philosophy 5

Background

The creation of models of sustainable development brings the identification and discussion on theoretical questions about distributive justice, economic ethics, poverty, social inequality and income, social and spatial mobility in an interdisciplinary perspective. The projects undertaken within the lines of research of graduate program in philosophy adress these themes with an emphasis on the significance of its normativity. In fact, the direction in which an epistemological model is endowed with regulatory burden is traditional theme of philosophy and has been the object of important contemporary studies (Line of epistemology and metaphysics). On the other hand, the way the normativity of the models is structured institutionally to create mutually exclusive classes or to provide conditions for social and economic recognition is subject line connecting Philosophy and Social Criticism. In addition, the conceptual history bias on the constitution of the normativity in its various bodies has been the object of research line in the History of Philosophy.

PPG Grade in the Quadrennial

International Strategic Studies 4

Background

72
The area of concentration of program is consistent with more than 15 years of research, guidance, education and scientific production of faculty of the program about the problems of socioeconomic development, integration, regional policy and international security. Far from merely juxtapose three central topics in the trajectory of countries and social groups outside the organic core of capitalism, a conscious effort and the persistences to produce adequate explanations and descriptions about the challenges posed by the growth of the power and the relative wealth of the so-called Southern countries in the 21st century are researched. With three lines of research that reflect the thematic cohesion of the project and at the same time the specific competences of the faculty, the area of concentration in development, integration and security allows the training of teachers and students specialized in themes and more dynamic regions of the contemporary world. In this way, the program fosters research on the issue of international cooperation, the issues related to security and development, both regional and global. In this context, Brazil's international insertion acquires centrality. The topics related to these themes are already part of the research projects developed in the framework of the program and are a central concern in many theses and dissertations.

PPG Grade in the Quadrennial
Chemistry 7

Background
In this research theme, the program proposal arises from their international collaborations, in the formation of high level human resources to the incremental transformations in areas relevant to chemistry, new materials, new technologies, green chemistry, new fuels and new energy, food security and intelligent materials, among others. These areas directly impact the quality of life of the population through the improvements achieved from the research developed, leading Brazil to a new paradigm of socio-economic development, whether through process optimization, products, by better control of food, the availability of new technologies relating to renewable energies, control of pesticides, less polluting industries, etc.

PPG Grade in the Quadrennial
Agricultural Microbiology AND THE ENVIRONMENT 5

Background
Aiming at the formation of high level human resources the program has three doctoral students and two students of master themes related to the development of new antimicrobial agents. The growing number of cases of resistance to human pathogens and agricultural impacts both the public and private sectors, being responsible for a large number of hospitalizations and deaths, in addition to extensive financial loss for the country. In this way, the development of knowledge in this area is of essential importance to lead Brazil to a new paradigm of socio-economic development. The projects that have been developed by our program focus on the training of human resources with diversity and ability required by the demands in chemical and/or microbiological areas, reflecting the multidisciplinarity of the program’s research on the incremental processing of synthetic substances aiming for the development of new products with clinical applications and the development of new agricultural technologies. Researchers of the program have already filed two patents for products obtained. In 2012 we conducted an International Symposium on Biotechnology Center, in Porto Alegre with leading researchers from of the main groups that investigate Escherichia coli extraintestinals worldwide (Charles Dozois, INRS, Canada; Catherine Schouler, INRA, France; Lisa Nolan and Catherine Logue, Iowa State University, USA; M. Mellata, then at Arizona State University, USA; Jorge A. Mirón, then in the Emerging Pathogens Institute, USA), and various Brazilian researchers in the area.

PPG Grade in the Quadrennial
Dentistry 6

Background
The Graduate Program in Dentistry, UFRGS, in its more than 25 years of existence has always aimed at the formation of qualified human resources for teaching and research, assuming a leadership position in the southern region of the country as an education center of excellence, having received grade six (6) in the last assessment exercise by CAPES. The program prioritizes internationalization, both from the point of view of academic mobility of faculty members and students an by receiving faculty and students from abroad. The program has a line of research on biomaterials and Therapeutic Techniques in Dentistry, which is concerned with the development of new technologies in health, both in the context of prevention and treatment of different oral health problems (in line with the development and integration of new technologies). It also includes the development of new materials, licensing of patents as a priority, from both domestic products using innovation with universal raw materials. In relation to the Health Sciences in large scale, this is the primary vocation of PPG, which counts with 3 areas of concentration, covering the entire spectrum of Dentistry, both for the individual and collective attention and with relevant academic production and interdisciplinary. Integration with other areas of knowledge is a strong indication that the academic production is in line with the contemporaneity. The economic studies in health are part of the activities of the program, which has the potential to improve health systems both in Brazil and in other countries, especially by strengthening the integration in the south-south axis. The primary mission of the Graduate Program in Dentistry is the formation of high level human resources, both for Brazil and for the region. Internationalization is, in this sense, a fundamental axis for the consolidation of the excellence goals. The participation in the PRINT call is of extreme importance for the program's goals.

PPG Grade in the Quadrennial

73
Background
The program develops research and continued production of innovative knowledge in areas such as Informatics, Education, Psychology, among others, enabling teaching professionals to interact with new technologies in their work environments. In particular we highlight investigations in the area of recommendation systems, educational games, mobile learning, virtual laboratories using immersive worlds aimed to support education in science and mathematics. It can be argued that the central aspect of the program (Computers in Education) is directly related to the integration of new technologies for the future work of educators and, consequently, is related indirectly with the future of the work of all professionals whose training pass through a process of formal or informal education. The program continues to be internationalized. Therefore, the university will remain strengthening its relations beyond the borders, thus consolidating and expanding the bilateral and multilateral cooperation with international institutions, with programs of academic mobility, students, and technical-administrative staff, political and academic performance at the university groups and in international programs, with the inclusion of new modalities of binational courses. In this sense the UFRGS strategic planning, contains the following strategic objectives related to this proposal: to strengthen the actions to host academic partners to encourage the establishment of international programs to graduate with a possibility of expansion of agreements of joint training exchanges of students and teachers; Greater visibility of the graduate program in centers of excellence in the regional area; to attract more foreign students; to enlarge the scientific production in international magazines; to stimulate teaching activities involving the international mobility, capabilities and enhancements of the program's interdisciplinary character.

PPG Grade in the Quadrennial
Genetics and Molecular Biology

Background
The program devotes intense efforts on the enhancement and improvement of working conditions for training of their graduate students. The program has 12 fully equipped laboratories for the development of research and projects, in addition to the general facilities of the University, with quality and opportunity to develop the most varied techniques and under conditions similar to those of the best international institutions. All students with exclusive dedication and working full time are recipients of grants from CNPq and CAPES or from international funding agencies. The program supports the post-graduate students participation in International Congresses through financial aid to all selected to compete for awards and shall meet periodically on the coming of foreign researchers to provide short-term courses or lectures. Once that fluency in the English language is still a barrier to internationalization, the program finances courses and lectures in a foreign language and its employment in scientific communication and provides services of linguistic correction of articles to be sent for publication. The program participates in all open calls for internationalization and makes use of all dimensions available for doctoral internships sandwich exchanges. In addition, our students are strongly encouraged to participate in international courses and other types of exchanges in order to expand their knowledge and skills. The excellence of the program in this direction can be measured through the destination of our graduates who, in their vast majority, are occupying positions as faculty or researchers in universities, both public and private, EMBRAPA, research institutes and private companies, many of them outside of Brazil. The program has obtained the highest CAPES evaluation grade, and it helps to attract post graduate students from various countries who seek quality in teaching and research.

PPG Grade in the Quadrennial
Education

Background
This is the great theme in which the program fits more evidently, with a history of 46 years, and more recently as a program of excellence within the scope of CAPES evaluation. The program contributes to the education of highly qualified researchers who have an expressive insertion in the regional and national levels, in different federal universities, state and private ones. Thus, the program is an important educational center of high-level researchers in the context of Brazilian postgraduate education.

PPG Grade in the Quadrennial
Materials science

Background
This research theme coincides with the research lines investigated by researchers at the graduate program in Materials Science. Such research lines are formed by several researchers who work on different topics within each line, such as: Creating and teaching of the Discipline NDIP100 - Entrepreneurship and Innovation, a cross discipline offered to all students of the postgraduate courses at UFRGS aiming at the qualification of the interactions between University and Businesses. The responsible Researcher within the program is Prof. Michele Oberson. The program is member of the consortium READY: Latin American and European Cooperation on Innovation and Entrepreneurship (through Prof. Michele Oberson). The program supports collaboration with the Swedish researcher Prof. Ernesto Gutiérrez, from Uppsala University. Additionally, the program performs constant exchanges with other universities in

**PPG  Grade in the Quadrennial**  
**Geography 6**  
**Background**  
Under an agreement signed between the Federal University of Rio Grande do Sul and the University of Minho, Portugal, the postgraduate programs in Geography of UFRGS and the University of Minho established agreement, in 2016, to foster joint research and publications and exchange of students and faculty members. The activities of the agreement between the programs are coordinated at UFRGS, by Professor Nelson Rego and, at the University of Minho, by Professor Ana Francisca de Azevedo. The activities of cooperation aimed at the development of research related to a socially inclusive Geography on the following fronts: the analysis and proposal of projects related to the improvement of living conditions of way associated with the preservation and enhancement of natural heritage and cultural heritage material and immaterial; the teaching of geography in formal contexts of education; the relationship between geography and education in non-formal contexts of Education. The activities completed at the time were the following: publication of the book "geographies and (in)visibilidades: landscapes, bodies, memories", with articles related to research developed by researchers of the UFRGS, Federal University of Santa Maria, of the University of Minho, the Laboratory of the landscape of Guimarães, Portugal, and the University of Sheffield, United Kingdom; completion of supervision of doctoral thesis on co-tutelage scheme between UFRGS and the University of Minho; lecture and institutional contacts of professor Ana Francisco at UFRGS; Course Taught by Professor Nelson Rego at the University of Minho. The activities in progress are these: book with articles related to research developed by researchers of the UFRGS, of the University of Minho and Brazilian universities, Latin American, Spanish and African Portuguese language; organization of international colloquium at the University of Minho and supervision of doctoral thesis on co-tutelage scheme between the UFRGS and the University of Minho.

**PPG  Grade in the Quadrennial**  
**Veterinary Sciences 6**  
**Background**  
The concept of food security, which involves the supply chain as a whole, is comprehensive. The program understands the right of everyone to the regular and permanent access to quality food, in sufficient quantity, without compromising access to other essential needs, taking as a basis of health promoting dietary practices that respect cultural diversity and which are environmental, cultural, economic and socially sustainable. In terms of international collaborations, the graduate program has established strong collaborations with groups from North and South America, Europe, Asia and Africa. This integration between research groups of Brazilians and foreigner institutions allow the development of studies and improvement of knowledge of post-graduate students, qualifying them for the job market. The integration between research groups is well established and has allowed the development of studies necessary to achieve the objectives proposed using synergistically the infrastructure and human resources existing in the various laboratories. The Graduate Program in Veterinary Sciences has worked heavily in order to provide training to teachers and doctors that meet the growing need of integration between human health, animal health, environment and public policies.

**PPG  Grade in the Quadrennial**  
**Industrial Engineering 7**  
**Background**  
The program develops various actions related to human resources education, especially with institutions abroad. The collaborations involve institutions in Latin American countries, Spain, Netherlands, Sweden and Cape Verde. The following is a brief description of the activities developed, justifying the inclusion of the program within this theme. The program participates of the “Red Iberoamericana de Ingeniería de Proyectos” (RIIPRO), whose purpose is the dissemination of research and practices developed within the framework of the management of projects for society, especially for the update of engineers of Mercosur. The program is part of a group - Latin American and European Cooperation on Innovation and Entrepreneurship. It is a project funded by the Erasmus+ to improve the mechanisms of university-industry relations, improve the skills for the teaching of entrepreneurship and promoting the spirit of innovation and entrepreneurship in all ten universities involved (the participating universities are from Sweden, the Netherlands, Spain, Brazil, Argentina and Uruguay). The program participates of RedEmprendia, a network of Ibero-American universities which promotes responsible innovation and entrepreneurship education. The RedEmprendia is partially financed by Santander bank and offers several programs to encourage entrepreneurship. The program also participates of the Masters Course in planning and design of the territory of the University of Cape Verde (COORDINATION AGREEMENT CAPES/UniCV/UFRGS). The program participates in the REDI4, Red de Investigadores en Ingenieria Industrial. The RedI4 is an academic community which promotes the generation and
exchange of knowledge in the area of research on Production Engineering. The network operates since 2006, when it held its first meeting.

PPG  Grade in the Quadrennial  
Chemical Engineering  6

Background
The graduate program in Chemical Engineering has been acting towards international cooperation in various ways. However, this is a point that still needs to be further explored. It is the organization of important events, participation in international committees and societies, receiving awards of international prominence and in cooperation with universities abroad for research collaboration. Special attention is being given to the qualification of both students and advisors, through doctorate sandwich internships, post-doctorate and missions of short duration. In this research theme, the graduate program believes that the education of high level human resources (notably master and doctorate degrees), focused on performance both in academia and in various industrial segments constitutes one of the central goals of graduate programs. The program has among its tasks the formation of human resources who are able to lead Brazil to a new paradigm of socio-economic development, linked to the aggregation of knowledge in all sectors of society. In the light of these aspects, this justifies the inclusion of the program in this research theme.

PPG  Grade in the Quadrennial  
Communication and Information  5

Background
The following graduate program research groups and laboratories are associated to the work in this research theme:  
- Laboratory of editing, Culture and Design (LEAD);  
- Research Group Semiotics and Communication Culture (GPESC);  
- Research Group Communication and cultural practices;  
- Nucleus of Research Culture and Media Reception (Nucmídia);  
- Research Group Representations, Social Memory and citizenship;  
- Study Group on Communication and imagination (Imaginalis);  
- Research Group (PROAv Audiovisual Processes);  
- Center for Research in Communication and Public Policies (NUCOP). The program identifies the following potential links to this research theme:  
(a) Research and collaborations - Consolidation of advanced research networks with Spain from joint work on two projects CAPES/DGPU already run, one with the Autonomous University of Barcelona and another with the Universidad Carlos III de Madrid. The consolidation of the agreement with the Catholic University of Uruguay for international doctorates and joint research projects.  
(b) educational exchanges - Strengthening of exchanges between UFRGS and the network of research CRI2i, already consolidated at an international level, fostering collaboration with visiting professors and internship sandwich doctoral students; - strengthening of partnerships with the Network Amlat aiming at the development of joint investigations, as well as the coming of visiting professors and students of the network for the completion of master and/or doctorate degree and internship sandwich programs. c) Co-tutelage agreements with countries with which there are already closer ties of partnership, such as Spain.

PPG  Grade in the Quadrennial  
Language and Literature  7

Background
This research theme is the most widely related theme to the activities of the Post-Graduate Program in Language and Literature. The education of human resources of high level passes necessarily by overcoming linguistic and cultural barriers through teaching and translation. The Graduate program in language and literature is a protagonist in this field. The program works towards mobility in and out of the university. The members of the graduate program develop online resources (glossaries, learning objects, tools to aid to writing) that have the objective of promoting the improvement of academic literacy of students, teachers, and staff of our university. In so far as they are developed, these resources are being made available on the Virtual Learning Environment LUMINA languages. There is also a cooperation agreement between the Instituto de Letras UFRGS and the Faculdade de Letras da Universidade Paul Valéry - Montpellier III (France). This has fosteres an academic mission, in 2016, "Teachers in university mobility" in the lab team Pique and at the Department of Portuguese Language. Professor Andrée Lepage from the Laval University (Quebec, Canada) taught a free course in the graduate program in 2017, an activity which is part of the agreement between our program and Laval. We currently host a sabbatical visitor at the Research Group of terminology and organization of knowledge (GTERM) from the Faculty of Information and Communication, Universidad de la República Argentina. As invited professor, ECHA will continued training course (Masters) in the same faculty between 05 and 10/03/2018, and from his post-doctoral studies, will be offered a covenant between the FIC and the IL, which is already in preparation. The same professor will act as a visitor at PUC-Chile to teach course on phraseology in the Masters Program in Translation. We now aims to formalize the agreements with the University of Granada and with the University of Manizales. Further, Professor Mara Ruth Glozman, from the University of Buenos Aires has taught a free course, in 2017, in this Program, under invitation from the group on research discursive and textual analysis. We intend to increase the dialog with Prof. Pedro Luis Luchini from the Universidad
Nacional de Mar del Plata, who also gave a free course on our program this year. We also plan to invite Prof. Andréina Adelstein from the University General Sarmiento, Buenos Aires.

PPG Grade in the Quadrennial
Public policies  5

Background
The faculty of the graduate program research group on Political institutions, state capacity and management of public policies have established partnership with French institutions of international reference in the area of Social Sciences and Political Science, such as: Institut d'Etudes Politiques de Paris Ecole des Hautes Etudes en Sciences Sociales of Paris, Université Paris I and Ecole Normale Supérieure, through joint research projects. The faculty of the line of research on Public Policies, Culture and Social Dynamics have a vast network of international relations: Program of Cooperation between the Freie Universität Berlin (FUB) - Latinamerika-Institut, Germany; Program of International Scientific Exchange Network in Social Anthropology: IDAES/UNSAM (Argentina), Museu Nacional, UFRJ and UFRGS (Brazil); cooperation agreement with the University of Cape Verde, with the support of CAPES and the Ministry of Foreign Relations of Brazil. With United States: project Building a pluralist nation: Multiculturalism and Identity in Brazil and the United States in the framework of the Edital CAPES/FIPSE. Project UFRGS/UFPE, Vanderbilt University and University of Florida Gainesville; there is agreement for teaching and research with Brown University and partnership with CIESAS/Occidente/Mexico. The faculty of social policies, actors and participation are involved the following international partners in research and teaching: Center de recherches sociologiques sur le droit et les institutions pénales (CESDIP)/Center National de la Recherche Scientifique (CNRS); Center for Social Studies, University of Coimbra; Chinese Academy of Social Sciences, University of San Marcos, Peru; Universidad de Guadalajara; Universidad de Concepción, Chile. Also noteworthy is the participation in the center of German and European Studies - with the goal of promoting academic collaboration between Brazil and Germany in the area of humanities (globalisation, sustainable development and cultural diversity): project approved by the Ministry of Foreign Affairs of Germany in 2016. Faculty of this line also have taught courses and conferences in foreign universities, in addition to arrangements for teaching and research with: Université de Montréal; Universidad de Guadalajara; bilateral Agreement UFRGS-UNICV - between the Ministry of Education and Development of Human Resources - University of Cape Verde; International Cooperation Capes/Foundation for Science and Technology of Portugal.

PPG Grade in the Quadrennial
Remote sensing  4

Background
The Graduate Program in Remote Sensing has the following aims associated to this theme:
- to consolidate the existing international partnerships, through the formalisation of cooperation in 100% of the activities, and the promotion of its reciprocity.
- to create, within the framework of the program, the Committee of internationalization, which is responsible for: (a) to propose incentive mechanisms and preparation for the participation of students and teachers in international initiatives; (b) to establish criteria for participation/selection, where applicable; (c) to propose mechanisms for dissemination of the experience gained by the beneficiaries of the graduate program; and (d) to manage the resources acquired.
- To promote the research visit of at least 2 members of the program to identified countries in of each one of the existing partnerships.
- To increase by at least 200% of the offering of courses taught in English.
- To increase by at least 100% student participation of the program in activities abroad, whether they are related to the doctorate sandwich internships or research visits.
- To increase by at least 100% the participation of foreign students in activities of the program, either in the form of sandwich internships or research visits.
- To Promote the qualification of at least 20% of the faculty, through sabbaticals.
- To promote the direct contact of the faculty with faculty and researchers with international experience.
- To create and English website.
- To offer a course on scientific writing in English in partnership with other programs at UFRGS.
- Results expected by the PPGSR: The strengthening of the bond and bilateral (reciprocity) in those cooperation agreements. This call offers a unique opportunity for consolidation of the program, by participating in international research groups, as well as a reward to the efforts of foreign interaction. We expect the creation of a culture of internationalization, with clear mechanisms and means for the engagement of students and faculty in international initiatives, as well as the construction of a more attractive scenario for the coming of foreigners. The Qualification/training/retraining of our faculty through direct contact with foreign partners, by research visits and bringing foreign partners to our program in research cooperation.

PPG Grade in the Quadrennial
Sociology  7

Background
Graduates of the program have shown excellent performance, with theses and dissertations awarded, jobs in universities and government agencies. In 2016 the program started a follow-up survey of graduates with a view to
identify the profile of our students, area of professional activity and feedback evaluation of the Program. The analysis of the professional integration of our alumni allows us to demonstrate the contribution to the Nucleation of undergraduate and post-graduate students in the country. Of the seventeen doctors trained in 2016, eleven are faculty in higher education (UFPEL, UFSC, UniRitter, UNILA, UNIPAMPA, UNIOESTE, São Judas Tadeu, Universidade Pedagógica of Mozambique, Université Paris I), two are teachers of technical federal colleges, one is a teacher, one public servant and one was not informed. Regarding the professional performance of graduates of the doctorate, 57 graduated between 2012-2016, 43 are linked to institutions of higher level education, three at UFRGS, ten in Federal Institutes within states of the southern brazilian geographic region, seventeen in federal universities, especially in the southern region, ten in private universities of the state and the region, and one in a state university also in the southern region, and two teachers at foreign universities. The others went to diplomacy, public bodies, primary schools, research institutes and the third sector. These data attest the capability that the program has shown in the preparation of the students, both for the period abroad as well as for their return to Brazil, especially in order to broaden the ownership by national institutions of knowledge and experience acquired. In addition to the regular formative activities of PPGS, we also highlight the work of teachers of the Program in offering training in analysis of qualitative data with the use of informational methodologies. The course given in January 2018 by Professors Alex Niche Teixeira and Melissa de Mattos Pimenta had more than 250 attendants, of the different disciplinary fields, which characterizes the program as a center of qualitative analysis with the use of informational tools.

PPG  Grade in the Quadrennial
Zootecny  6

Background
The education of high level human resources, having in view the necessary diversity and aiming to enable incremental and cultural transformations that are able to lead Brazil to a new paradigm of socioeconomic development, linked to the aggregation of knowledge in all sectors of society. The actions associated to this research theme are those of greatest activity within the graduate program in zootechny, consolidated by nucleation and insertion of the program doctoral graduates in universities and research centers in Brazil, as well as in positions of leadership, coordination and strategic positions at these institutions.

PPG  Grade in the Quadrennial
Molecular and cellular biology  7

Background
The program and its faculty has already formed over two hundred masters and more than one hundred doctoral graduates. The faculty has actively participated in the organization of dozens of workshops in the areas of Neurogenetics, bioinformatics, molecular biology of microorganisms and plants. It is worth noting that the national and international partnerships have also resulted hundreds of publications of articles in co-authorship on research lines. The program acts prominently in the national and international scene through the training of teachers and qualified doctoral students, contributing to the development of their areas of research.

PPG  Grade in the Quadrennial
Physics 7

Background
The program has made research contributions directly linked to this theme. In particular, we would highlight: The study of water, a natural resource whose importance is essential to life. Cleaning and treatment of water requires development of cutting-edge technologies, strongly based on microscopic models. The program through the work carried out by the group of Prof. Marcia Barbosa is at the forefront of this field. The area of Physics of Materials, is one of the strengths of the program; Advanced Materials with new properties, are indispensable for the advancement of almost all the project research themes; the program has also highlighted actions in nanostructures, sustainable development, diversity, climate change, environmental sustainability, social, economic, ethical and legal aspects. The program also develops new materials for purification of liquids. In terms of research in Biological Physics, techniques of networks theory and simulation, simulation techniques for active substance Nanostructures, magnetic and superconducting materials, which are in fundamental areas of research for training human resources for the development of the country. The Graduate Program in Physics has formed along its existence more than 500 masters and more than 400 doctors in physics. The researchers of the program in conjunction with their students publish an average of more than 200 articles per year in indexed international journals with high impact parameters.

PPG  Grade in the Quadrennial
DESIGN  5

Background
The Graduate Program in Design has a strong presence in this research theme, highlighting the development of several studies, which resulted in theses, dissertations and publications in the following themes: proposition of the Design Process for Interactive infographics with educational purposes; Learning standards-based design requirements for the preparation of projects of generativos learning: An application in teaching in design; systematization of knowledge for the development of interactive digital virtual environments. Still in this research theme the Graduate Program in Design can work in collaboration with the following post-graduate programs of the UFRGS: Industrial Engineering (PPGEP/UFRGS); Computing (PPGC/UFRGS); Mechanical Engineering- Group of
thermal and energy and the Research Group in Sustainability and Innovation (School of Business Administration - UFRGS)

PPG  Grade in the Quadrennial
Physics 7
Background
The program has made research contributions directly linked to this theme. In particular, we would highlight: The study of water, a natural resource whose importance is essential to life. Cleaning and treatment of water requires development of cutting-edge technologies, strongly based on microscopic models. The program through the work carried out by the group of Prof. Marcia Barbosa is at the forefront of this field. The area of Physics of Materials, is one of the strengths of the program; Advanced Materials with new properties, are indispensable for the advancement of almost all the project research themes; the program has also highlighted actions in nanostructures, sustainable development, diversity, climate change, environmental sustainability, social, economic, ethical and legal aspects. The program also develops new materials for purification of liquids. In terms of research in Biological Physics, techniques of networks theory and simulation, simulation techniques for active substance Nanostructures, magnetic and superconducting materials, which are in fundamental areas of research for training human resources for the development of the country. The Graduate Program in Physics has formed along its existence more than 500 masters and more than 400 doctors in physics. The researchers of the program in conjunction with their students publish an average of more than 200 articles per year in indexed international journals with high impact parameters.

PPG  Grade in the Quadrennial
Geosciences  7
Background
The Graduate Program in Geosciences has four (4) areas of research: GEOCHEMISTRY, Paleontology, Marine Geology and Stratigraphy. In each of these areas, there are different research groups that already perform actions on the research themes, highlighted in partnerships with foreign institutions or individual researchers informally (through research work carried out in partnerships without a formal agreement), or formally (through formal agreements between the groups, post-graduate programs or universities). Through the Laboratory of calcareous Microfossils (LMC) the program has formed masters and doctors, as well as received students for activities of scientific initiation, undergraduate projects and internships. It is part of the 'internationalisation' of training of these students, in particular of the master's and doctoral students the integration with researchers from other countries, both through short visits abroad or sandwich internships and/or participation in international events. The scientific visits of foreign researchers to the program is highly valued. In the area of Marine Geology, the faculty work in the Polar and Climate Center (CPC), the headquarters of the National Institute of Science and Technology (INCT) of the Cryosphere at UFRGS. The CPC integrates the national and international scientific community dedicated to the study of the variability of different components of the planetary mass of ice (Antarctic marine ice, glaciers and the mantle of antarctic ice, Andean glaciers, permafrost) and their response to global climate change and climate and the Paleoclimate of southern South America. Researchers also participate in expeditions and international consortia in the area of marine sciences for data collection, as for example, the International Ocean Discovery Program (IODP), promoted internationally and supported by CAPES. In the lines of Geochemistry of Minerals and Rocks, Geotectonics and Geology isotope and Metalogeny researchers develop their research in partnership with researchers from other countries through the (a) Erasmus Mundus program, at master level (France- Greece-Canada-Portugal-Brasil); (b) program of Multiple Diplomas of academic mobility (France-Greece-Brasil); c) Cooperation with Petrobras, with the presence of researchers from the University of Madrid-Universidade of Aveiro-Universidade of Nice.

PPG  Grade in the Quadrennial
Visual Arts  5
Background
The program striking a transdisciplinary effort, stands for excellence in the continuity of the training of art historians (a very recent undergraduate degree in Brazil, but the backbone of culture and science in developed countries) and in the training of artists, seeking and reaching education parity levels with their colleagues from abroad. Both research areas of the program, in History, Theory and criticism and on Visual Poetics have offered knowledge of complex construction, unifying different fields of knowledge, with international acceptance.

PPG  Grade in the Quadrennial
Biological Sciences (Physiology)  5
Background
All the activities of research and teaching program are linked to the research theme, because they involve the education of high-level human resources in various areas of knowledge. The transformations generated from the training of professionals in the areas of health, ecology, science and technology inevitably must generate profound changes in the quality of life of the Brazilian society. Therefore, we believe that all faculty members of the program work in this research theme.
Human Movement Sciences 6

Background
With respect to the Theme 8, the actions of internationalization of two lines of research will assist in the further qualification of the faculty in research projects, as well as in the formation of health professionals committed to the development of intervention strategies appropriate to minimize the difficulties of children with coordination disorder, and yet, we investigate the challenges of confronting and ageing society and with the comorbidities associated with ageing, especially regarding degenerative diseases.

PPG Grade in the Quadrennial
Physics Teaching 5

Background
The program is a national reference in the training of teachers and qualified doctors. It is basically a consensus that Brazil needs to reconsider the scientific education offered to its citizens at all levels of education. In particular there is a huge shortage of physics teachers with appropriate training in the area. One of the main challenges is to make sure that the results of the research in teaching and education not only reach the classrooms, but are also produced by taking into consideration the different knowledge levels of teachers associated with the teaching-learning process. The graduate program has provided an important contribution in the formation of human resources of high level since its foundation. In 2002 the program offered the first Professional Master's in Physics Teaching in Brazil, having formed, up to the moment, 110 teachers. Even though the first goal was the qualification of teachers from the state schools and municipal governments, the fact that nowadays many of these teachers are teachers of Federal Institutes is an evidence of the lack of qualification of physics teachers. In terms of research in Physics Teaching, the contribution of the program is widely recognized for the training of teachers and doctors with relevant intellectual production associated to subjects such as topics of Modern Physics and contemporary, Information and Communication Technologies in the Teaching of Physics, Computational Modeling in the Teaching of Physics and Active Methods of Teaching. The program has highly qualified international collaborations, which illustrates the qualification of masters and PhDs graduated by program. Among these collaborations we mention: Harvard and Texas-Austin (USA); Universidad Distrital Francisco José de Caldas (Colombia); University of Valencia (Spain) and the University of Lisbon (Portugal).

PPG Grade in the Quadrennial
Music 7

Background
In relation to the Theme 8, studies so far undertaken along the area of interpretative practices within the program have the opportunity for training human resources at a high level, who become active in the artistic and academic environment at national and international level. These studies have allowed to systematize and disseminate ways of teaching and learning of musical instruments. The dissemination of scholarly research and the realization of courses and workshops have allowed to multiply the knowledge acquired and to systematize it into various sectors of society.

PPG Grade in the Quadrennial
Soil Science 6

Background
Linked to Theme 8, the program has already trained 323 masters and 103 doctoral graduates, with a significant portion of these occupying positions of prominence and leadership in public institutions of teaching, research and extension of the country, in addition to Brazilian companies and private institutions. The number above also includes masters and doctors of Latin-American countries, especially Chile, Colombia and Uruguay.

PPG Grade in the Quadrennial
Social and Institutional Psychology 5

Background
The program has a direct relationship with this research them, in view of their qualified collaborations with reference countries in research and teaching in the area. In addition, the program aims to achieve through this theme the following macro-objectives:
- Increase the partnerships already established, aiming to strengthen international relations, especially with the countries of Latin America, North America and Europe;
- to give continuity to host the post-graduate students coming from countries of the african continent, opening up possibilities for the establishment of institutional partnerships with universities in these countries, involving technical missions and doctoral stages;
- to encourage a greater number of publications in international journals, in co-authorship between Brazilian and foreign researchers;
- to encourage a greater number of publication of articles in a foreign language, and also in the scientific journal of the Program.

PPG Grade in the Quadrennial
Food Science and Technology 5

Background
In relation to the Theme 8, the program is developing actions aiming at the formation of human resources at a high level, including the training of masters and doctoral students in collaboration with institutions abroad. In the period 2013-2017, doctoral candidates of the program went to doctorate-sandwich internships, developing their activities in several universities abroad, including Wageningen University (Netherlands), Vrije Universiteit Brussel (Belgium), Università di Pisa (Italy), University of Lisbon (Portugal), University of Porto (Portugal), the University of Almeria (Spain), Universidad Autonoma de Madrid (Spain) and Universidad Politecnica de Valencia (Spain). During this period there were short-duration missions abroad for faculty and students of the program and visits of foreign researchers, involving the institutions described below: Institute of Catalysis (CSIC, Spain), Center of Etiologia y Applied Biology (CSIC, Spain), Universidad de Murcia (Spain), Università di Pisa (Italy), University of Lisbon (Portugal), RIKILT Food Safety Institute (Netherlands), Texas A&M University (United States), Universidad Mayor de San Marcos (Peru), Universidad Nacional del Litoral (Argentina), Universidad de Santiago (Chile), Ibn Khaldoun University (Algeria) and Howest University College West-Flanders (Belgium). In addition to the various international cooperation described above, which has enabled PhD-sandwich internships, the program also receives students through the Graduate (PEC-PG/CAPES) program, as well as foreign students who enter by the international call of the program. These arrangements have contributed to the inflows of masters and doctoral students from Mozambique, Colombia, and Ecuador. Through exchange programs the program also received students in sandwich modality from Argentina, Colombia and Mexico.

PPG Grade in the Quadrennial
Botany 5

Background
The Program aims at the formation of qualified human resources, so that also contributes to the theme education of high level human resources. In this context, we highlight the participation of the PPG Botany in International Master in Applied Ecology (IMAE), in the framework of the Erasmus program of the European Commission, where UFRGS through the PPGs in botany, Ecology and Animal Biology, is one of the main partners, along with renowned institutions of education and research communities (University of East Anglia, United Kingdom; Universität Kiel, Germany; Université de Poitiers, France, and University of Coimbra, Portugal). The program has highlighted actions nationally and internationally, with several collaborations that aim at the training of qualified masters and doctoral students. The results of these activities translate into a growing number of articles produced with coauthors of foreign institutions, article publication in high level journals (including in Science) and the activities of researchers in editorial bodies of international magazines as well as other global initiatives (such as the Sciency-Policy Intergovernmental Platform on Biodiversity and Ecosystem Services IPBES). The placements of doctorate sandwich internships, mainly in the USA and in European countries, but also in Argentina is another example of the growing internationalisation of the graduate program (between 3 and 8 students per year, in the last four years of evaluation have gone abroad). The topics of these activities research on biodiversity (projects in the area of systematics, evolution and ecology of algae, plants and fungi) and a better understanding of its operation (projects in the area of plant morphology, plant physiology and plant ecology), as well as the conservation and management of natural resources (plant ecology). The international collaboration on research also has influenced teaching activities. Some disciplines have been offered exclusively in English. In 2016 it was held, for the first time, a discipline of field with 10 students of the program in conjunction with a group of 10 students and a faculty member from the Technische Universität München, Germany.

PPG Grade in the Quadrennial
Child and Adolescent Health 5

Background
In relation to this theme, the program emphasizes the performance of the faculty associated to the line of research on epidemiology, pathogenesis, phenotype, genotype, treatment and prevention of defects, during the epidemic of the Zika virus and the syndrome of microcephaly associated with the virus. In addition to being among the researchers who collaborated with the Ministry of Health in the evaluation of infants with suspected microcephaly, and with the State Department of Health in strategies for detection and prevention, the group published relevant articles from an international point of view on the subject, among which we mention: MICROCEPHALY in Brazil: how to interpret reported numbers? Lancet, 2016 and possible association between Zika virus infection and Microcephaly - Brazil, Morb Mortal Wkly Rep. 2016, this last being the first study that showed evidence of teratogenicity of Zika virus causing microcephaly and other brain damage and neurological. Published in the journal of the Centers for Disease Control (CDC) of the United States, was one of the most cited articles of the year 2016.

PPG Grade in the Quadrennial
Performing Arts 4

Background
In relation to Theme 8, at the intersection with Theme 6, there are artistic projects in progress, the result of a research developed in the Performing Arts, which in addition to dialogue with a research group of the Program of Visual Arts, articulates research, teaching and extension, promotes social inclusion and diversity, connecting academic knowledge with artistic-cultural production in direct dialogue with the community. In addition to the field that puts in connection art, urban space, conviviality and citizenship, this line investigates modes of production in the performing arts, related to the perspective of the creative and sharing economy.
PPG  Grade in the Quadrennial
Mining Engineering, Metallurgy and Materials  7

Background
In this specific issue, we can highlight the following points associated with the program: a) Integration of undergraduate and postgraduate students in teaching, research and extension activities. b) Integration with the productive sectors of industry and services both in the qualification of its staff, as the development of research activities. c) Qualification of permanent faculty, as well as employees and visitors. d) Laboratories are very well equipped with constant investment in improvements and technical suitability experimental. e) Increase in the number of laboratories concerned with quality (counting with laboratories with accreditation by the metrological network and INMETRO) f) Integrative research lines and verticalized that, in addition to high scientific development, are linked to the development of the region and country. g) International interaction with universities and research centers of recognized competence. h) The concern that the activities developed will contribute greatly to the process of development of society, the qualification of human resources, the availability and generation of best technologies, generation of employment and the greater quality of the environment in which it is inserted.

PPG  Grade in the Quadrennial
Administration  5

Background
Among the topics addressed in the projects are those relating to sustainable development in their various perspectives, innovation and competitiveness, and to the qualification of human resources at a high level, which are investigated in the context of societies and organizations. In this way, the program contributes to the formation of a high level of intellectual capital to engage teachers and students in teaching, research and extension activities that are effectively aligned to research lines of the PPGA and the demands of the country as a whole. In the last three years, the teachers of the program developed international cooperation with 46 different international institutions, especially in countries such as the United States, France and the United Kingdom. The main activities performed were international missions and joint research projects with the partner institutions, which resulted in joint publications and exchanges of students and professors. It should be emphasized that more than 75% of teachers of the program developed research projects in conjunction with institutions at international level in this period. At least 18 students participated in a sandwich with these partner institutions. In addition to these projects in which international institutions cooperate directly with the PPGA/UFRGS, the Program also participates in joint projects under the coordination of other partners, both at the national level, as well as international. Among the external partners are the Université de Tunis (ESSEC, Tunis - Tunisia), Escuela Politécnica Nacional (Quito - Ecuador), Milano Management School (New York - United States), Wageningen University (Netherlands), University of California (Bron School, Santa Barbara - United States), University of Valle dos Sinos (Unisinos), Embrapa, Universidade de São Paulo and Getúlio Vargas Foundation (FGV). Research are also carried out in partnership with various UFRGS graduate programs, such as: Agribusiness, Rural Development, Industrial Engineering, Center for International Studies on Government, Law, Computers in Education.

PPG  Grade in the Quadrennial
Political Science  5

Background
The PPG on Political Science qualifies human resources of high level for four decades. Several of its graduates were absorbed by educational and research institutions among them, we can highlight- UFRGS itself, Universidad de la Republica [Uruguay], UFF, UnB, UFSCar, UFSC, UFMA, UFS, UFRN, UERJ, UFRGS, UFPeL, UFSM, UFES, UNIPAMPA, FURG, PUCRS, among others. Part of its graduates also acts in public administration and in the political field, in the country and abroad. The Program promoted a DIINTER with UFRR and with the Catholic College of Rondônia, thus forming human resources in the north of the country. The research conducted in the Program comprise the different dimensions of political phenomena (institutional, international, cultural, and theoretical); in addition to contributing to the advancement of scientific knowledge, are also instruments to qualify the public debate and inform policy makers. In terms of the internationalisation of the Program, in the last four years, three teachers held senior stage and seven acted as visiting professors in universities in the United States, United Kingdom, France and Argentina; 18 students were sent to perform sandwich Doctorate abroad and 15 foreign students enrolled - the majority through programs such as PEC-PG and OAS. The program received two post-doc fellows, who also increased the number of publications in international journals and maintains a strong presence at events of international scientific associations as a Latin American Studies Association, International Studies Association and the Latin American Association of Political Science. The program also hosts, in Brazil, the World Values Survey, international consortium of research of values and cultural change. In addition to this, teachers of the program integrates international networks of research consolidated as the network of Comparative Politics, which involves researchers from UFRGS, Universidad de la República (Uruguay) and Universidad Nacional de Rosario (Argentina) and the "International Network Brazil Argentina of comparative analysis of foreign policies, national defense and international security of Argentina and Brazil in the beginning of the 21st century" in partnership with PPG on Strategic Studies (UFRGS), three Argentinian universities (UNQ, UNLP, UNR) and two Brazilian universities (UERJ and Unesp). The program has six agreements on international cooperation.

PPG  Grade in the Quadrennial
Music 7

Background
The Group of Musical Studies (GEM) of PPG-Music, along its history of two decades, has invested on the qualification of teachers and researchers capable of developing research projects that map and analyze the multiple configurations of musical practices in contexts of inequality, exclusion and violence, whether they are inside or outside Brazil and being accountable for the actions of intervention arising from claims received in the field. Consonant with this focus, the education offered in the subarea of ethnomusicology, has emphasized the student access to a varied spectrum of literature and first-hand contact with teachers-researchers from outside UFRGS and the seniority in the qualification of master and PhD students. This is the case of the recent residence at PPGMUS (November 2017) of the Kenyan ethnomusicologist Jean Madagascar Kidula, professor of ethnomusicology and African-American Studies at the University of Georgia-Athens (UGA).

ACTIVITIES LINKED TO THE THEMES

Theme 1 – Sustainable development, diversities, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal aspects
Goal – Research on sustainable development integrating different perspectives

Activity 1
Insertion of the university in research and discussion forums on climate change
Start date - 08/2018 \hspace{1cm} End date - 07/2022
Description
Increased insertion of the university in research networks and discussion forums on climate change, involving partners from the United States, France, Germany, England, Italy, Denmark, Norway, Switzerland, among others.

Activity Indicator
Type - Quantitative
Indicator - Participation in international events related to climate change
Current situation - 12
Goal for the 2nd year - 24
Final goal - 32

Activity 2
Studies in international partnership involving social inclusion and diversity
Start date - 08/2018 \hspace{1cm} End date - 07/2022
Description
Studies in international partnership involving the implementation, monitoring and evaluation of programs of social inclusion and openness to diversity.

Activity Indicator
Type - Quantitative
Indicator - Productions in co-authorship on the proposed theme
Current situation - 14
Goal for the 2nd year - 25
Final goal - 35

Activity 3
Establishment of a research network for studies related to sustainable development
Start date - 08/2018 \hspace{1cm} End date - 07/2022
Description
Establishment of a research network with international partners for studies involving historical, political, cultural, ethical and legal issues related to sustainable development
Activity Indicator
Type - Quantitative
Indicator - Universities engaged in the network
Current situation - 0
Goal for the 2nd year - 6
Final goal - 10

Theme 2 – Integration of Basic Science, Information Technology, Engineering, Arts and Mathematics [STEAM]
Goal – Expansion of projects comprising STEAM integration

Activity 1
Creation of research lines focused on STEAM integration
Start date - 08/2018 End date - 07/2022
Description
Creation of research lines contemplating different graduate programs, with support from international partners, to conduct STEAM integration projects
Activity Indicator
Type - Quantitative
Indicator - New lines of research on the theme
Current situation - 0
Goal for the 2nd year - 3
Final goal - 6

Activity 2
Development of projects involving STEAM integration
Start date - 08/2018 End date - 07/2022
Description
Development of projects in international partnership with universities from Germany, France, Canada, the United States, Australia, Sweden, among others, involving Integration between Basic Science, Information Technology, Engineering, Arts and Mathematics [STEAM]
Activity Indicator
Type - Quantitative
Indicator - Research projects involving STEAM integration
Current situation - 5
Goal for the 2nd year - 10
Final goal - 18

Theme 3 – Impact, development, access to and insertion of new technologies, artificial intelligence, information technology and robotics in the future of work
Goal – Study of new technologies

Activity 1
Establishment of a network to study the impact of new technologies

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Establishment of international network including universities from the United States, Germany, France, England, Canada, Italy, among others, to study the impact of new technologies on individuals, companies and industrial sectors.

**Activity Indicator**
Type - Quantitative
Indicator - Universities involved in the network
Current situation - 0
Goal for the 2nd year - 6
Final goal - 10

**Activity 2**
Establishment of a network to study the future of work

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Establishment of international network including universities in Portugal, Spain, Belgium, the Netherlands, Norway, Sweden, among others, to study the future of work, involving professional profile, transformations in existing professions and emergence of new professions.

**Activity Indicator**
Type - Quantitative
Indicator - Universities engaged in the network
Current situation - 0
Goal for the 2nd year - 6
Final goal - 10

**Activity 3**
Proposing new graduate programs or concentration areas aligned with new technologies and professions

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Planning and implementation of new graduate programs or concentration areas specifically focused on the research of new technologies and professions, counting on international partnerships, aiming the formation of human resources with the necessary competencies to work in these areas.

**Activity Indicator**
Type - Quantitative
Indicator - Number of new concentration areas aligned to the theme
Current situation - 0
Goal for the 2nd year - 2
Final goal - 4

**Theme 4 – Large-scale Health Sciences, Translational Medicine and its socio-economic impact**

**Goal** – Advances in large-scale health science

**Activity 1**
Deepening of research oriented by translational medicine

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Deepening of research guided by Translational Medicine, supported by international success stories, in partnership with universities from the United States, Canada, England, Germany, Australia, France, among others.

**Activity Indicator**
Type - Quantitative
Indicator - Productions in co-authorship on the proposed theme
Current situation - 12
Goal for the 2nd year - 22
Final goal - 30

**Activity 2**
Study of national programs for health promotion

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Study of models for health promotion adopted at different countries, in partnership with universities of the respective countries, notably Canada, England, Germany, Australia, France, Spain, the Netherlands, Portugal, Norway, among others.

**Activity Indicator**
Type - Quantitative
Indicator - Productions in co-authorship on the proposed theme
Current situation - 6
Goal for the 2nd year - 14
Final goal - 22

**Activity 3**
Evaluation of the economic impact of health programs

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Study, in partnership with international universities, of the economic impact of and results from health programs.

**Activity Indicator**
Type - Quantitative
Indicator - Productions in co-authorship on the proposed theme
Current situation - 10
Goal for the 2nd year - 20
Final goal - 28

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**Theme 5 – Energy of the future, new fuels, non-pollutants and/or recyclable**

**Goal – Studies concerning non-pollutant and/or recyclable energy sources**

**Activity 1**
Study of new technologies for energy conversion and storage

Start date - 08/2018   End date - 07/2022

Description
Study of new technologies and alternatives for the conversion and / or storage of energy in partnership with universities from United States, England, France, Germany, Italy, among others.

Activity Indicator
Type - Quantitative
Indicator - Productions in co-authorship on the proposed theme

Current situation – 15
Goal for the 2nd year – 25
Final goal - 40

Activity 2
Establishment of a network to study the use of new fuels

Start date - 08/2018   End date - 07/2022

Description
Establishment of international network including universities from the United States, France, Germany, England, Italy, among others, to study the issues of sustainability, economic viability and use of new fuels.

Activity Indicator
Type - Quantitative
Indicator - Universities involved in the network

Current situation - 0
Goal for the 2nd year - 4
Final goal - 10

Activity 3
Study of energy sources of interest to the country

Start date - 08/2018   End date - 07/2022

Description
Study of clean energy sources relevant to the national reality, in partnership with countries (United States, Germany, France, England, Sweden, Australia, among others) that stand out in the use of the respective sources.

Activity Indicator
Type - Quantitative
Indicator - Energy sources studied and diagnosed in international partnership

Current situation - 1
Goal for the 2nd year - 3
Final goal - 5

Theme 6 – Smart cities, complex urban areas, 4.0 Industry and circular economy

Goal – Study of smart cities and complex urban areas

Activity 1
Establishment of a research network on circular economy applications

Start date - 08/2018  End date - 07/2022

Description
Establishment of an international network including universities from France, Germany, England, Italy, Portugal, Spain, among others, to study the issues concerning circular economy and its applications.

Activity Indicator
Type - Quantitative
Indicator - Universities engaged in the network
Current situation - 0
Goal for the 2nd year - 5
Final goal - 10

Activity 2
Study of smart cities considering international best practices

Start date - 08/2018  End date - 07/2022

Description
Study of smart cities in partnership with universities from England, Holland, Sweden, Belgium, among others, considering international good practices and adaptations necessary for the Brazilian scope.

Activity Indicator
Type - Quantitative
Indicator - Dissertations and theses developed on the theme
Current situation - 6
Goal for the 2nd year - 12
Final goal - 18

Activity 3
Insertion of industry 4.0 in the Brazilian context

Start date - 08/2018  End date - 07/2022

Description
Study of industry 4.0 in partnership with universities from the United States, France, Germany, Italy, Canada, among others, aiming to incorporate implementation models into the reality of the different Brazilian industrial segments.

Activity Indicator
Type - Quantitative
Indicator - Productions in co-authorship on the proposed theme
Current situation - 12
Goal for the 2nd year - 24
Final goal - 36

Theme 7 – Research on agriculture, supply chain and food safety

Goal – Study of food chains of interest for the country

Activity 1
Study of food chains of interest to the country

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Study of food chains relevant to the national reality, in partnership with countries (United States, Australia, Argentina, Canada, China, among others) that also stand out in the production of the respective foods

**Activity Indicator**
Type - Quantitative
Indicator - Food chains mapped and diagnosed in international partnership
Current situation - 5
Goal for the 2nd year - 8
Final goal - 12

**Activity 2**
Establishment of a network for the study food safety

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Establishment of an international network including universities from France, Germany, England, Italy, Spain, among others, to study issues related to food safety in the main food segments.

**Activity Indicator**
Type - Quantitative
Indicator - Universities involved in the network
Current situation - 0
Goal for the 2nd year - 6
Final goal - 10

**Activity 3**
Insertion of new technologies in agriculture

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Study of new technologies and alternatives for the sustainable production of healthier foods in partnership with the United States, Australia, Argentina, Canada, China, among others.

**Activity Indicator**
Type - Quantitative
Indicator - Productions in co-authorship on the proposed theme
Current situation - 20
Goal for the 2nd year - 35
Final goal – 50

**Theme 8 – Education of high level human resources for activities in strategic areas**

**Goal** – Education of high level human resources

**Activity 1**
Expanding the international experience of graduate students

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Increase of the number of graduate students participating in missions and sandwiches abroad, involving well-ranked universities.

**Activity Indicator**
Type - Quantitative
Indicator - Number of graduate students exposed to international experience

Current situation - 150
Goal for the 2nd year - 250
Final goal - 500

**Activity 2**
Expanding the international experience of the teaching staff

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Increase in the number of teachers enrolled at foreign well-ranked universities as a postdoc fellow or a visiting professor.

**Activity Indicator**
Type - Quantitative
Indicator - Number of teachers with internships abroad in well-ranked universities

Current situation - 540
Goal for the 2nd year - 680
Final goal - 800

**Activity 3**
Continuous qualification of graduate programs

**Start date** - 08/2018  **End date** - 07/2022

**Description**
Graduate programs must be continuously updated in order to follow the state of the art, ensuring the education of human resources fully prepared for advanced research in the respective areas of knowledge.

**Activity Indicator**
Type - Quantitative
Indicator - Number of programs presenting CAPES concept equal to or greater than 5

Current situation - 47
Goal for the 2nd year - 47
Final goal - 50

**STRATEGIES**

1. **Strategy for the consolidation of existing international partnerships, as well as the construction of new partnerships and cooperation projects to increase the relationship between the Brazilian institution and research groups abroad.**

As mentioned in the section "Partner choice policy", we have determined an indicator of partnerships to classify them into three groups: Group 1 – "very strong partners" – partners with a history of mutual funding and leading research
with at least four different graduate programs at UFRGS; Group 2 – “strong partners” – partners with a history of mutual support concentrated in one or two research groups; and Group 3 – “quality partners” – partners that have had a comparatively more recent history or interaction with smaller groups. This grouping is in line with the countries of the partner high education institutions (HEI), taking into consideration their scientific experience and their history of partnerships with Brazil. Group 1 clusters the United States, France, Germany, Canada, Italy, UK, Spain in one compound. Group 2 refer to the same countries or countries from similar regions, but with either smaller or more recent history with Brazil: Australia, French-speaking Canada, Sweden or Norway. Group 3 includes the major emerging BRICS and Latin-American countries. This grouping and ranking made it possible to combine the indicated partnerships with national scientific policies. Many HEIs in Group 1 have access to extensive scientific programs (Horizon2020 in Europe, NFS in the USA, partnerships with the private sector in the case of the United Kingdom or Canada, funding from the DAAD, the British Council, or the CNRS) with which UFRGS has had collaborations in the past. These have resulted in highly acknowledged actions such as the creation of the Center for European and German Studies - CDEA - at UFRGS (in partnership with PUCRS) in 2017, with the support of the DAAD, or the creation of a LIA/CNRS with France, in Computer Science, as well as to the participation in two H2020 projects, from 2016 to 2018. In this group, support for the Institutional Internalization Project (IIP) would reinforce international co-funding in programs on which our researchers have relied for years. As for Group 2, we aim at the increase in quality in existing joint research; with the help of researchers who are already in contact with UFRGS, it is expected to extend the partnership to other areas of knowledge. UFRGS’s indication of its eight themes for its IIP aims at the fostering of collaboration and complementarity. With Group 3, the strategy is to consider the IIP funding as “Seed money,” that is, investment in actions such as missions of Ph.D. students, with potential for added value that would not be developed without such support.

2. Strategy to attract foreign students to Brazil.

The Office of International Affairs was created at UFRGS in 1992 and has been a leading player in student mobility since 2000. Starting already in 2008, the Office has gained relevant experience through significant participation in Erasmus Mundus programs, with the management of hundreds of students over five years and with its six administrative staff members having had received training in European International Offices. The “Science Without Borders” program was particularly significant at UFRGS, and fostered the expansion of the International Office. Every semester, UFRGS receives about 700 foreign students (1/3 undergraduate students, 2/3 graduate students). In 2018, most international students at UFRGS are Latin American, with Colombia, Argentina, and Peru as their leading countries of origin. However, France, Germany, and Spain have also consistently sent us students, on account of our research agreements and the quality of our laboratories.

At the graduate level, the PAEC and PEC-PG programs is to be stressed as having historical importance for UFRGS. UFRGS holds the fifth position in number of hosted PAEC foreign doctoral students in Brazil. UFRGS provides support to international students through multilingual information about the country, the city and the university before they come (with a website and a PDF guide in English), an Accommodation Guide, and welcome/information sessions on arrival. This material has been recognized at the national level, and UFRGS has organized several training events on the management of incoming students. The increase of non-Latin American incoming mobility is due to the expansion of the offer of courses in English, which needs to be stimulated still at UFRGS. Double diploma agreements, at undergraduate and doctoral level (cotutelle), have also been successful tools for attracting international students. German and French students, in particular, have seen cotutelle as a motivation to study at UFRGS. UFRGS has also organized summer schools to attract younger foreign students who may later choose to

91
return for a period of study in Porto Alegre. We intend to expand this offer (in particular using our partnership with the Coimbra Group of European universities), aiming at the increase of UFRGS´ international visibility.

3. **Strategy to attract faculty and researchers with international experience.**

UFRGS has been working with foreign professors and researchers for a long time. Historically, major graduate programs such as Chemistry, Physics or Hydrology resulted from interactions with foreign researchers. UFRGS already has permanent professors of German nationality (Computing, Education, Philosophy), French (Chemistry, Computing), North American (Sociology), Australian (Language and Literature), Argentinian (Engineering) and Uruguayan, Dutch (Computing) - not counting numerous professors with dual nationality, from Italian and German descent, something very common in Rio Grande do Sul. Some of our departments have already organized selective processes in which the tests are in English, and this option is to be expanded at the University. Courses in English, which are already offered by several Graduate Programs, shall increase with the IIP, enabling the insertion of foreign teachers. Rather than focusing on the public HEI legislation for hiring personnel, which is very strict, we intend to base our strategy on the offer of scholarships that will attract international doctoral students to UFRGS and motivate them to take part in our selection processes. Such scholarships have proven to raise interest in our teaching positions among foreign graduate students impressed by UFRGS´ rich research capability. To help promote UFRGS abroad and provide guidance to foreign professors and researchers who join us temporarily or permanently, the university relies on an Office of International Affairs with experience in student mobility management and in providing support at the reception of foreign students, through multilingual information about the country, the city and the university before arrival (with a website and a PDF guide in English), an Accommodation Guide, and through welcome/information sessions. We aim at expanding our support services, including, for example, guidance for matters that concern the family members of our international junior researchers, such as childcare or school information.

4. **Strategy to prepare the scholarship holders for the period abroad as well as for their return, especially in order to increase the knowledge appropriation by the institution.**

As explained in the section "Strategies for Attracting Foreign Students," UFRGS has an Office of International Affairs highly qualified to manage student mobility. Concerning outgoing student mobility, the good practices learned throughout the thirty years of the Erasmus program in Europe have led to the establishment of a protocol for selecting, preparing, monitoring and revalidating the activities of students in mobility. Efficient communication with the International Offices of foreign universities guarantees the quality of the selection processes, along with the extensive promotion of the mobility opportunities and the organization of evaluating committees for the selection processes. Interactions also occur with institutions that offer proficiency tests (Alliance Française, Cervantes Institute, British Council, Language without Frontiers). Information sessions are offered to students in order to prepare them for diverse in the education systems abroad and cultural shocks, and also to help them develop a study plan for credit revalidation upon their return to UFRGS. After the mobility, the International Office continues to mediate communication between the host HEI and the student’s department of origin at UFRGS, to ensure analysis of the activities that were conducted abroad. After returning, students are also encouraged to report their experiences abroad, especially during the annual event "Salão UFRGS" or "UFRGS´ Academic Week." The same preparation opportunities are also offered to graduate students (doctoral students), professors, and researchers, although they are not essential to these more experienced groups. In this case, the revalidation of the activities conducted abroad is also different, as the publication of quality scientific articles is usually the expected outcome of such mobility.
Therefore, the primary challenge in strategic terms is the socialization and the institutionalization of the experience after the return to UFRGS, which often happens during their participation in research seminars and research group meetings. Within the context of the IIP, the Management Committee will consider their reports to feed the database related to the international partnerships supported by the program.

5. **Describe innovative strategies that will be used by the institution that were not mentioned above.**

We highlight a policy of internationalization of UFRGS and its research based on innovation, through two other modalities: 1) to offer and promote internships in companies or research laboratories abroad for UFRGS students, and for international students in Porto Alegre. A recent partnership with Sweden, Holland, and Spain has been initiated, led by UFRGS's Office of Technological Development, to foster the entrepreneurial and innovation culture within the university. Its actions are complementary to research activities, and also involve professors of the graduate programs contemplated by the IIP; 2) our university also has several business incubators, which have a natural vocation to work at an international level (particularly when working in ICTs) and are interested in hosting foreign interns or in hiring UFRGS alumni who underwent a mobility period abroad. International experience is considered very important in the development of new business and startups. Another important source of opportunities to be developed in the scope of the IIP is the "Scientific Initiation" program (Programa de Iniciação Científica). Little known abroad, this important activity of "research teaching" enables young foreign students to be admitted to internships in laboratories and research groups, under the supervision of Senior Researchers, promoting the interaction between researchers from UFRGS and foreign HEI partners. Reciprocally, a Brazilian student with "Scientific Initiation" experience has outstanding potential not only to go abroad and participate in classroom activities but also to interact with foreign researchers and promote their interaction with research groups at UFRGS. Another segment with high potential to support international-level research at UFRGS is Extension. Here are two examples with different institutions and countries: a) the Graduate Program in Geology will be integrated to a yearly extension action that takes thirty students to the Andes for two weeks, visiting sites in Argentina and Chile. The group studies the rocks and sediments of the Cordillera in partnerships with Geologists from National University of Tucuman (Argentina); b) UFRGS is one of ten Brazilian universities that host a Chinese Confucius Institute. This Institute, via extension activities, is a valuable tool to promote linguistic and cultural interactions, which in turn lead to new partnerships among researchers. The latest examples are in the area of visual arts (with calligraphy) and food safety. Extension activities at UFRGS are funded autonomously and thus enable the involvement of scholars for relatively short periods of time, providing nonetheless a fertile environment for initial contact and preparation for more traditional research. Finally, another strategy to strengthen qualitative international research partnerships is the establishment of Double Degree agreements at the undergraduate level. Their obvious purpose is the qualification of our curricula, but such agreements also prepare the student to match the requirements of both UFRGS and a partner HEI, turning him or her into a solid candidate to enroll in international programs in cotutelle. Many of our professors, who graduated from UFRGS and pursued doctoral studies in cotutelle with Écoles Centrales, Grenoble-INP, TU Berlin, and POLITO, may attest to the success of such experiences with these partners.
1. **Policy for selection of foreign partners**, considering that 70% (at least) of the resources should be earmarked for partnerships with institutions based on countries that Capes maintains effective cooperation (listed in Annex I of the call).

UFRGS’ Institutional internationalization Project (IIP) for graduate programs and research is based on the internal diagnosis of the pre-existing partnerships through the aggregated knowledge provided by (a) the Offices of Graduate Studies and Research, especially to obtain the history of international funding; (b) the Office of International Affairs, to gather information about international agreements and concrete activities supported by them; (c) a questionnaire sent to all graduate programs potentially eligible to the IIP. In the questionnaire, each participating Graduate Program indicated to which of the eight transdisciplinary scientific themes it could contribute, and listed its foreign partners as well as the co-funded international activities developed in collaboration with them. These data were used to determine a list of potential partners ordered by an indicator that corresponds to the sum of three criteria: (1) the excellence of the Graduate Programs that initiated the partnerships (basically measured by the capes evaluation rank of the Program). (2) the excellence of the Foreign Partners (measured by the international rankings ARWU, QS and THE). (3) the quality of the academic relationship between the graduate program and the partner, measured by the existence of missions (incoming and outgoing researchers), sending/receiving doctoral candidates, and co-organizing scientific events. It should be noted that this indicator makes it possible to prioritize not only the absolute quality, at UFRGS or abroad, of the partners involved, but also to consider the history of the relationship. Moreover, this indicator enables not only a ranking of partners and activities, theme by theme but also, and above all, the establishment of a weighted average of the total required budget proportionally to this indicator. Thus, we have an efficient and fair tool to allocate the IIP budget during the next four years properly. The result of this analysis led to the definition of the partnership consolidation strategies presented in another section. Interestingly, it showed that the targeted partnerships matched the countries prioritized by CAPES: the indicator led to 364 HEIs from 38 different countries, 89.3% of which are in the list of countries prioritized by CAPES, with a few exceptions (Australia, Portugal, Chile and Colombia). Therefore, the leading research in UFRGS, concentrated in the countries contemplated in the CAPES PRINT call, is naturally much higher than the 70% signaled by CAPES. Our project reinforces this trend with policies for internal selection of specific actions and beneficiaries abiding by the funding principles of the PRINT program.

2. **Grant policy and internal selection process for specific actions**, within the funding lines of the Capes-PrInt program. In the case of cooperation projects with foreign institutions, the proposer should specify the application of funds, the plan of activities, reciprocal funding, academic mobility, technical - scientific production, counterparts in the partner institutions, among others.

As explained in the Section "Policy for selection of foreign partners," an indicator was defined that prioritizes the indicated partners, scientific theme by scientific theme, as informed by those eligible to the IIP. Considering this indicator, we can distribute the total budget allocated to UFRGS in through the PRINT call, on a theme-by-theme, topic-by-topic basis, in accordance with the proportional importance of each partner - or, preferably, each country or other grouping of partner HEIs (for example, if they are grouped according to a thematic network of its own; an example would be a partnership with the various Canadian HEIs of the CALDO excellence group). The organization per country allows for scale gains, since in the same mission the researcher from the country of origin can meet
researchers from different universities in the country of destination. In addition, it also facilitates agreements involving development agencies or embassies of the respective country. This makes it possible for UFRGS, through the IIP management group, to issue regular calls for proposals to promote the modalities listed by the Graduate Programs, theme by topic, prioritizing the pre-defined partner HEIs. To enable the necessary planning (particularly in the case of mobilities) on the part of the researchers, we are planning to issue calls every six months. The calls for proposals will require research projects with clear identification of their quantitative and qualitative objectives. The existence of co-funding on the part of the partner will be an important criterion in the selection process (the questionnaire led us to opt for partners with whom UFRGS has had co-funded collaborations in the past). A final report from the researcher will be requested for accountability (refer to Section "Knowledge appropriation policy" for more details) and the results achieved and reported after obtaining some PRINT funding will be considered for new applications. Although the calls for proposals may deal with different modalities (mobility of Ph.D. candidates, organization of events...), the selection process will prioritize candidates who will choose modalities that reinforce the partnerships and the quality of the results. Typically, a Ph.D. mobility should be integrated with other actions with the partner to avoid isolated missions (except in the case of innovative partnerships, from Group 3, as discussed in the section "Consolidation of existing international partnerships").

3. **Policy for hiring faculty with recognized scientific performance at an international level.**

The section "Strategies for attracting foreign professors and researchers" has already contextualized UFRGS’ policy regarding the employment of foreign teachers. Part of the policy elements described in this section applies to professors with recognized international experience. It should be noted that the sixty-five Graduate Programs included in UFRGS’ IIP have a CAPES rank equal or superior to 4. Among them, fifteen have a rank 7, eighteen have a rank 6 and twenty-one have a rank 5. The world-renowned quality of the scientific evaluation conducted by CAPES guarantees that the professors hired to work in these programs were selected taking into account their internationally recognized scientific production. The selection process at UFRGS includes a written test, a didactic test, a curriculum analysis, and the evaluation of a research proposal. During the evaluation of the curriculum and research proposal, in particular, considerable weight is given to qualified scientific production. In a university where, in 2017, 91.8% of the professors have a doctoral degrees (according to https://www1.ufrgs.br/paineldedados/ufrgs_numeros.html#Docen), the analysis of the research proposal is instrumental in breaking ties between applicants. The value attributed to the research proposal is reinforced by a policy of promotion of post-doctoral studies abroad. Even recently hired professors working in the graduate programs participating in the IIP usually have the opportunity to take a leave for research and to dedicate three to six months to their research abroad. This is a practice that also fosters exchange opportunities for the students whose advisor has spent some time abroad for post-doctoral work.

4. **Policy to increase proficiency in foreign languages for students, postgraduate faculty and technical staff that have a direct relationship with the proposed Internationalization Project.**

UFRGS is is located in the capital of Rio Grande do Sul, a State with strong European origins on the border with Uruguay and Argentina. Thus, the university is in a relatively favorable linguistic situation in comparison to other universities in Brazil. Many members of the UFRGS community are familiar with the German and Italian languages. The specific relationship of Rio Grande do Sul with Germany led the DAAD to choose Porto Alegre to host the first Center for Advanced European Studies of the Southern Hemisphere. Spanish is also ubiquitous in Rio Grande do Sul. Regarding English, UFRGS hosts the largest Teaching Center of English Language of Brazil, supported by Language Without Borders, a national initiative. The Center was created in 2015. It is well known that the issue of foreign languages is a limiting factor in the internationalization of higher education in Brazil. Foreign languages are absent
from the curricula of many undergraduate courses. At the graduate level, the requirement for proficiency in at least one foreign language exists but does not always guarantee the proper knowledge of the idiom. The problem will only be solved in the long haul, once foreign languages are taught in secondary education; to this end, UFRGS is engaged in the training of Foreign Language teachers (“Licenciatura”). At the university level, a decision was made to include foreign language classes in some curricula at the undergraduate level. This is the case, for example, in Engineering with the French language, to increase student mobility under the BRAFITEC program. At the graduate level, the most immediate effort, which has already begun, involves the use of English in the classroom, both by teaching researchers and students when presenting papers or reading articles. Since most of the bibliography, in the internationalized graduate programs eligible to the IIP, is in English, this effort is not difficult to make, depending more on the choice of the teacher than on an idiomatic difficulty. Already we have had experiences in this regard in several programs: a 2017 internal survey showed that eighteen Programs provided classes taught in English, including Administration (as part of an International Master taught in English), Electrical Engineering, Materials Mining and Metallurgy, Computing, Ecology, Mathematics, and Epidemiology.

5. **Policy for recognition of academic and scientific activities performed by faculty and students abroad.**

UFRGS has extensive experience in managing international student mobility. During the early 2000s, the Office of International Affairs started this activity with AUMG’s “Escala” program, expanded its expertise with Erasmus Mundus projects with the European Union from 2009 onwards, and implemented large-scale consolidated procedures from 2012 to 2016 in the program "Science Without Borders." Therefore, UFRGS already has inner regulations regarding outgoing student mobility, which is conditioned to the previous signature of a learning agreement. The learning agreement plans the recognition of the credits obtained abroad when the student returns, after an evaluation at the Department level (“Comissão de Graduação”). For graduate students, two situations are considered: if the student has conducted performs academic activities overseas that qualify for credit attribution (for example for mobility occurring during the first year of a master's degree), revalidation can easily occur as is often the case of undergraduate students. However, a most interesting situation arises when the M.Sc. or Ph.D. student goes abroad for research activities in a laboratory or on the field. In this case, the evaluation of the activities and the academic recognition upon the return of the student depends on the quality of the research carried out, i.e., the publications issued or the experimental results obtained. For Faculty mobility, we also have two situations: when the professor has conducted research activities, the recognition of the activities at UFRGS is based on the publications, the experimental results, the participation in scientific events that the stay abroad has or will provide, or the organization of scientific meetings. The inclusion of students advised by the professor in the partnership is another critical point in the evaluation of the activities conducted by the teacher with his or hers international partners. When mobility focuses on teaching activities, the activity plan should evaluate the lessons (volume, schedule, expected public), as well as assess how much of the teaching abroad experience will sift into the teaching practice at UFRGS upon the return of the professor. The international technical-administrative mobility is also worth mentioning. It serves to train staff members to apply their procedures in an international context (for example, to support students of foreign nationality when they enroll in a UFRGS course), or to Brazilian academics who must interact with universities abroad (for example, to support the application to international research notices, as in the context of the H2020).

6. **Policy for hosting and support of foreign faculty, researchers and students.**

As explained in the sections "Strategy to attract faculty and researchers" and "Strategy to attract foreign students", UFRGS already has an Office of International Affairs (RELINTER) that provides a set of services for foreigners who
come to study, teach or conduct research at the University. RELINTER's Web site provides explanations and information about Brazil, Porto Alegre, and the University, aiming at assisting with accommodation and urban locating in the city. In conjunction with the Consulates of Brazil abroad and with the foreign Consulates in Brazil, RELINTER also provides the necessary documents to obtain visas for permanence. English guides for students and general visitors are edited yearly and are available in electronic format via the UFRGS website. Every semester upon the arrival of foreigners RELINTER organizes welcome sessions and information meetings. Depending on the profiles of the arriving students and researchers, group meetings are organized (for undergraduate students), or individual (for researchers). In specific cases, the foreign individual is assisted in matters concerning visa issues by Brazilian Federal Police, or in matters concerning the opening of a bank account. Constant contact with the consulate of the country of origin is also maintained. During their stay, foreigners are assisted at the level of the academic department. Tutors are appointed to monitor undergraduate students, and graduate students have an advisor. As a rule, researchers already know a local professor who most of the times is the originator of the invitation to come to UFRGS. The Office of International Affairs gets involved whenever complex intervention is required (illness, repatriation, visa problems). UFRGS also organizes integration and cultural activities every semester. Foreigners (and Brazilian alumni in mobility programs) are systematically encouraged to participate in and develop "internationalization at home" programs. This is particularly the case during the period of the "Salão UFRGS", and during the "academic weeks" (specific weeks designated as non-classroom teaching periods). Events specific to a country are also held for those who have a strong presence in UFRGS (France, Colombia, China, Germany), in collaboration with the consulates of these countries.

7. Policy for the appropriation of knowledge and experience acquired abroad by the beneficiaries of the actions of the Institutional Internationalization Project.

From 2012 to 2016, UFRGS has sent more than 2,500 undergraduate and graduate students abroad through the program "Science Without Borders". Its Graduate Programs of CAPES rank 4, 5, 6 and 7 have a wide experience in sending Ph.D. students for internships abroad: in 2017, 212 doctoral students were sent to 24 different countries. Their strongly internationalized advisors abroad frequently participate to and organize international events. Therefore, the appropriation of international experience ("internationalization at home") has been a practice for some time at UFRGS. Undergraduate students are required to provide transcripts of their records in order to revalidate the credits obtained abroad at UFRGS. They are encouraged also to attend meetings with junior students to introduce them to international experiences and to help prepare them for future mobilities. Many university courses require that the student conduct a public defense in front of a jury as an evaluation criterion for the revalidation of the credits. Doctoral students and advisors usually give seminars on their research, either to prepare for the participation in a conference abroad or upon their return as a way to report and share the experience and the contacts they have made abroad. At UFRGS, the primary challenge on this topic is to move from the sum of individual experiences, transmitted by face-to-face interactions, to an institutional knowledge of its international partnerships which are fostered by each member of the community. Our policy for this is the development of a database that will aggregate and combine the partnership indicators that we have defined for IIP (overall amount of funded actions with each foreign partner), along with other parameters of academic collaboration that are not related to research (mobility at undergraduate level, cultural partnerships, cooperation and institutional visits). It is hoped that this tool will help maintain the history and the breadth of each partnership, to be consulted and perused in the development of new contacts between institutions.

Members for the IIP Management Committee were selected at UFRGS as a way to represent the major scientific topics of research covered by the proposal, and include senior researchers (Fellows of CNPq productivity grants), with substantial international experience. The invited international expert, Hans-Ulrich Heiß (TU Berlin), has a strong knowledge of UFRGS, CAPES, and Brazil in general, having participated in joint research, developed double diploma and cotutelle agreements with UFRGS, and being one of the managers of the international excellence policy of TUB.

The role we have designed for the Committee will be the validation of the launch of internal calls, the appointment of evaluators of the applications submitted by the researchers, the final validation of the selected beneficiaries, and the monitoring of the results of the international actions promoted. The Committee will rely on the reviewers and evaluators, who will come from the Graduate Programs that are associated to the UFRGS IIP. The calls will be released for each of the eight scientific themes chosen. Since each one is transversal and multi-disciplinary, reviewers and evaluators may come from Programs other than the applicant's, which will avoid conflicts of interest. Many UFRGS researchers have experience in participating in CAPES evaluation committees and in the review of research projects. Technical-administrative staff from the Offices of Graduate studies, of Research, and of International Affairs (which has plurilingual and trained technical staff to deal with international partnerships) will support the Steering Committee and the Reviewers / Evaluators to launch and promote the calls, check the applications, organize the meetings, etc.

In order to define the calls, the Committee will follow the questionnaire that has been carried out before the submission of this proposal, which has led to the definition of a weighted list of international partners with a strong relationship history with UFRGS. As explained in the section "Grant policy and internal selection process", this list makes it possible to allocate the overall budget in the proportion of the importance that our researchers give to each international partner, theme by theme. It is therefore relatively easy to define calls with a defined budget amount, for each strategic theme, to offer funding for each modality (visiting professor, Ph.D. mobility, etc.) and each international partnership to the Programs that qualify in each theme.


1) At the individual level: The selective calls launched at UFRGS will require the proponents to identify the objectives to be followed (for example qualified publications, participation in scientific events, access to some specific research infrastructure). The reports, which will be evaluated later, should compare the original objectives with the results achieved, with the necessary justifications if there is a lack of results. Any goal that would not be fulfilled by an applicant will penalize the scientist in subsequent calls. Since PRINT will last four years, the Management Committee will thus have a possible academic action to control the correct use of the funding by the applicants, in addition to the usual legal means.

2) At the institutional level: as explained in the section "Policy for the appropriation of knowledge and experience acquired abroad", one of the monitoring tools will be a database of the partnerships developed or expanded with PRINT funding, and the modalities that will have been dedicated to the partnership. The reports of the beneficiaries will feed the database. This will make it possible to verify how, in addition to the individual benefit, the PRINT funding will broaden partnerships. It should be noted that we can also calculate performance indicators (for example, published articles) not only at the researcher level, but also theme by them, or international partner by international partner. Thus, we will be able to analyze the interest of the financial support for each different modality of partnership. A particular point will be the financial counterpart brought by each partner. The selective calls will give priority to those proponents who bring in co-funding from the international partner. (The questionnaire that enabled us to define the partners listed in our proposal has prioritized the identification of those which had a history of joint funding.) This
particular criterion, as well as the symmetry of the partnership regarding mobility flows, will be monitored by the Steering Committee.

10. Policy for the conciliation of national development programs supported by Capes to the internationalization effort.

CAPES has maintained a series of national development programs, in which a significative number of UFRGS graduate programs have been actively involved. Among others, the PRINT project of UFRGS will be connected to many activities already underway: 1) Program of Support to Events in the Country (PAEP): The project of internationalization of research and graduate studies of UFRGS aims not only to provide an international experience to our community but also to incorporate into UFRGS the experiences of foreign researchers. As explained in other sections, there will be greater emphasis on encouraging the visit of graduate students and international researchers. These visits will be opportunities for the colleagues to teach lectures and classes at UFRGS, in addition to conducting their research with our scientists. There will be a natural integration of these guests to the scientific events organized in the country, thus qualifying and expanding the transmission of international knowledge to the entire national scientific community, beyond the walls of UFRGS. This type of phenomenon has already happened in the past in many of the events organized by UFRGS researchers, who have gradually become international conferences. 2) Interinstitutional Ph.D. (DINTER): UFRGS has been sought by several smaller HEIs in the country to develop doctoral programs. This has happened even at the international level, with contacts for example in Uruguay (UDELAR), in Colombia, or in Peru. By using PRINT to expand the internationalization of our graduate programs, this experience will naturally qualify the DINTERs associated with UFRGS's Programs as well. 3) PROAP & PROEX: Due to the quality of UFRGS's Programs contemplated by our PRINT proposal, the number of PROEX projects is also high. The PRINT plan will be driven centrally by the Management Committee and be the Dean of Graduate Studies. It will be a natural complement to the PROEX funding that is specific to each Program according to its internal purposes. PRINT will be aggregating policy instrument to align international partnerships among Programs with similar scientific interests, within the defined transversal themes. Thus, PRINT allows the definition of a "macro" internationalization policy, while PROEX will be used for the "micro" adjustments, internal to each program.

11. Describe here other innovative policies that will be adopted by the institution that were not addressed in the above items.

The diagnosis made at UFRGS in 2017 and the questionnaire of international partnerships returned by the Graduate Programs shows a polarization of the partner countries. UFRGS has an essential role in the training of human resources at the graduate level in some Latin American countries (Colombia, Peru, Bolivia, and also Mexico and Argentina), where it sends few researchers and doctoral candidates. On the other hand countries like Canada, the United States or the United Kingdom are strong destinations of our researchers, but send us little personnel. There is yet a group of countries (Germany, France, Spain, Italy) with which flows are quite balanced. For those, one can speak of partnership with symmetry. Based on of this diagnosis, and on an internationalization policy that includes UFRGS's affirmation of a regional leadership, it is essential that our project allows increasing the excellence of our research through collaborations with countries with strong scientific impact; but also that we can move forward towards a better relationship with Latin America through (i) An improved reception of the Latin American researchers, junior and senior, who are looking for us. Their presence is essential in UFRGS to diversify our research, to foster partnerships in strategic problems specific to the continent (examples: tropical diseases, management of large rivers, biodiversity, urbanization), and also to prepare the next generations of researchers in the region. (ii) The expansion of our presence in the Latin American partner countries to help them strengthen their graduate programs, in the same
way as UFRGS graduate studies have been developed by the experience of our researchers in Europe and the United States these last four decades. Another aspect of our internationalization policy - and the improvement of our research in general - that is not highlighted in the rest of this proposal is the articulation of fundamental research with innovation and the productive sector. Internationalization helps us in this regard, owing to the experience of many of our foreign partners on this issue. For example, UFRGS started a partnership through an Erasmus+ project “Capacity Building in Higher Education”, coordinated by Uppsala University (Sweden), together with the universities of Groningen (Netherlands) and Valladolid (Spain). Not surprisingly, Uppsala and Groningen appear as essential partners of UFRGS, respectively cited by three and five distinct graduate programs that have joint collaborations, with funding. The project has helped to identify that our pre-existing academic research could benefit from an exchange of good practices to be transformed into products and services to the society. This is exemplary of other partnerships that we want to promote: In geology and Computing with the universities of Oslo and Aberdeen on oil, in collaboration with Petrobrás and British Gas; in Health and Medical Engineering with FAU Erlangen and the experience of “Medical Valley” with the support of Siemens to develop in Greater Porto Alegre; with Airbus in Civil Engineering and Electronics on board, in partnership with Toulouse, among others. There are several cases where the international partnerships of UFRGS can be amplified by the experience of the industrial sector that they bring.

FURTHER INFORMATION

1. **Number of postgraduate courses taught in English between 2013 and 2016.**
   
   **Quantity of courses** – 268

2. **Number of joint supervision postgraduate programs between 2013 and 2016.**
   
   **Quantity of programs** – 52

3. **Number of double degree postgraduate programs between 2013 and 2016.**
   
   **Quantity of programs** – 1

4. **Number of bilateral postgraduate programs between 2013 and 2016.**
   
   **Quantity of programs** – 0

5. **Number of products derived from research projects and contributions to international databases between 2013 and 2016.**
   
   **Quantity of products and contributions** – 115

6. **Number of Capes’ development programs from which the institution benefited between 2013 and 2016.**
   
   **Quantity of programs** – 59

7. **Number of Capes’ international cooperation projects from which the institution benefited between 2013 and 2016.**
   
   **Quantity of projects** – 182

8. **Insertion of materials, themes and subjects in foreign language in the postgraduate program curricular structure.**
The inclusion (or extension in number) of courses taught in foreign languages in the curricular structure of UFRGS' graduate programs is being developed through discussions and proposals within the Forum of Directors of Graduate Programs. The adaptation of curricular structures is part of the Institutional Internationalization Project and also of the Institutional Internationalization Plan of UFRGS, as well as the increasing in number of publications of scholar articles in foreign languages. The broadening of non-Latin American incoming mobility is dependent on the extension in number of courses taught in foreign languages, a phenomenon that has already begun but that merits a tightening of pace at UFRGS. The offer of materials, the inclusion of themes and topics, in foreign languages, will be treated in a case to case basis, with the concourse of the academic sectors of the university, among which are the Chamber of Graduate Studies and the Council for Learning, Research, and Extension.
### EXPECTED BENEFITS

#### Theme

8. EDUCATION OF HIGH LEVEL HUMAN RESOURCES FOR ACTIVITIES IN STRATEGIC AREAS

#### Projects of International Cooperation

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Start Date: 01/08/2018</th>
<th>End Date: 30/06/2022</th>
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<tbody>
<tr>
<td>Cooperation with institutions in the United Kingdom for Qualification of Human Resources in Strategic Areas</td>
<td></td>
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<tr>
<td><strong>Description</strong></td>
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<tr>
<td>This project contemplates the expansion of the international cooperation with the United Kingdom. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: University of Exeter, King's College London, University of East Anglia, Queen Mary University of London, University of Nottingham, University of Essex, University of Kent, London School of Economics, University of Cambridge, University of Sheffield, University of Huddersfield, University of Oxford, University of Hull, University of Lancaster, University of Manchester, University of Bristol, University College London, University of Edinburgh, University of Aberdeen, Bangor University and University of Cardiff. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Social anthropology, Cellular and molecular Biology, Botany, pharmacology, Biological Sciences - ecology, economy, Civil engineering: construction and infrastructure, Mining engineering, met and materials, International strategic studies, Philosophy, Physics, Genetics and molecular Biology, psychology, Hydric resources, Child and adolescent health</td>
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</table>

### Project Name

Cooperation with institutions in the United States for Qualification of Human Resources in Strategic Areas

**Start Date: 01/08/2018**  **End Date: 30/06/2022**

**Description**

This project contemplates the expansion of the international cooperation with the United States. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: Harvard University, University of California, Ohio University, State University of Arizona, University of Georgia, Princeton University, Brown University, University of Michigan, George Washington University, Georgia State University, University of Florida, University of Minnesota, University of Illinois at Chicago, Texas A&M University, University of Miami, University of Iowa, University of Pennsylvania, Stanford University, University of Texas, Ohio State University, Carnegie Mellon University, University of Connecticut, Rutgers University, Denver University, University of Notre Dame, St. Louis University, Cornell University, Georgetown University, University of Chicago, Penn State, University of Berkeley CA, York University, Texas Tech University, Dartmouth College, Virginia Tech, University of Virginia, Washington University St Louis, Case Western Reserve University, University of Colorado, University of Missouri, Clemson University, North Carolina State University, University of Georgia-Athens, Vanderbilt University, University of Nebraska Lincoln, University of madison-wisconsin, Auburn University, Johns Hopkins University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Social anthropology, Cellular and molecular Biology, Soil Science, Political Science, Biological Sciences - pharmacology, Veterinary Sciences, Economics, Education, Nursing, Civil Engineer: construction and infrastructure, Chemical engineering, Physics teaching, International strategic studies, Philosophy, Biology, Genetics and molecular Biology, Geosciences, History, Applied Mathematics, Agricultural and environmental microbiology, Music, Dentistry, Public policies, Psychology, Social psychology, Hydric Resources, Child and adolescent health, Remote sensing.

### Project Name

Cooperation with institutions of Germany for qualification of Human Resources in Strategic Areas

**Start Date: 01/08/2018**  **End Date: 30/06/2022**

**Description**

This project contemplates the expansion of the international cooperation with Germany. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: Freie Universität Berlin, Universität Kiel, Technische Universität München, Universität Mannheim, Universität Stuttgart, Justus-Liebig-Universität Gießen, Technische Universität Darmstadt, Aachen University, University of Dortmund, University of Hanover, University of Duisburg-Essen, Universität Hamburg, Goethe Universität, Humboldt-Universität, Berlin, Ludwig- Maximilians-Universität München, Universität Bonn, Universität Würzburg, Universität Tübingen, Karlsruhe Institute of Technology, the University of Muenster, Friedrich-Alexander- Universität, Ruhr- Universität Bochum, RWTH Aachen, Ruprecht-Karls-Universität Heidelberg. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Social anthropology, Cellular and molecular Biology, Botany, Soil Science, Political science, Computing, Communication, Rural development, Ecology, Chemical engineering, International strategic studies, Philosophy, Genetics and molecular Biology, Geosciences, History, Applied Mathematics, Dentistry, Public policies, Hydric resources, Zootecny.

### Project Name

Cooperation with institutions of France for qualification of Human Resources in Strategic Areas

**Start Date: 01/08/2018**  **End Date: 30/06/2022**

**Description**

This project contemplates the expansion of the international cooperation with France. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: Université de Lorraine, Université Paris Dauphine, Université de Grenoble Alpes, Université Paris Descartes, Aix-Marseille Université, Université de Poitiers, École Normale Supérieure de Cachan, Université Paris I - Panthéon Sorbonne, Université Paul Sabatier, Toulouse 3 Grenoble INP, Université de Lille, Université Paul-Valéry Montpellier 3, École Normale Supérieure, Université de Bourgogne, Université Paris 7 Denis Diderot, Université Pierre et Marie Curie, Université de Montpellier. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Social anthropology, Performing arts, Visual arts, Cellular and molecular Biology, Botany, Soil Science, Political Science, Computing, Design, Ecology, Chemical-engineering, Epidemiology, International strategic studies, Philosophy, Physics, Genetics and molecular Biology, Geosciences, History, Language and literature, Applied Mathematics, Public policies, Hydric Resources, Sociology, Zootecny.
Cooperation with institutions in Canada for qualification of Human Resources in Strategic Areas

Start date:   01/08/2018              End Date:   30/06/2022

Description
This project contemplates the expansion of the international cooperation with Canada. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: University of Laval, Université de Montréal, University of Toronto, McMaster University, University of British Columbia, University of Alberta, Simon Fraser University, University of Waterloo, McGill University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Agribusiness, Social anthropology, Soil Science, Biological Sciences - Nursing pharmacology, Economics, Chemical engineering, Philosophy, Language and literature, Applied Mathematics, Dentistry, Public policies, Social psychology, Hydric Resources, Child and adolescent health, Sociology.

Cooperation with institutions of Spain for qualification of Human Resources in Strategic Areas

Start date:   01/08/2018              End Date:   30/06/2022

Description
This project contemplates the expansion of the international cooperation with Spain. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: Universidad Complutense de Madrid, Universidad de Santiago de Compostela, Universidade de Barcelona, Universidad Carlos III de Madrid, Universidad Autónoma de Barcelona, Universitat Politècnica de Valencia, Universidad Autónoma de Madrid, Universidad de Sevilla, Universitat Rovira i Virgili, Universitat Politècnica de Catalunya, Universidad Pompeu Fabra, Universidad del País Vasco, Universidad de Valencia. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Soil Science, Political Science, Biological Sciences - pharmacology, Communication, Rural development, Economy, Nursing, Civil Engineer: construction and infrastructure, Chemical engineering, Philosophy, Biology, Public policies, Psychology, Social psychology, Hydric Resources, Child and adolescent health, Remote Sensing, Sociology, Zootechny.

Cooperation with institutions in Portugal for qualification of Human Resources in Strategic Areas

Start date:   01/08/2018              End Date:   30/06/2022

Description
This project contemplates the expansion of the international cooperation with Portugal. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: University of Coimbra, Universidade Nova de Lisboa, Universidade do Minho, Porto University, University of behind-the-Montes e Alto Douro, Universidade de Aveiro. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Social anthropology, Botany, Communication, Ecology, Economy, Education, Nursing, Civil Engineer: construction and infrastructure, Chemical engineering, Philosophy, Geography, History, Agricultural and environmental microbiology, Music, Public policies, Social psychology.

Cooperation with institutions in Australia and New Zealand for qualification of human resources in strategic areas

Start date:   01/08/2018              End Date:   30/06/2022

Description
This project contemplates the expansion of the international cooperation with Australia and New Zealand. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: University of Melbourne, University of Queensland, University of Western Australia, University of South Australia, University of Sydney, James Cook University, University of Newcastle, Flinders University, Monash University and the University of Auckland. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Ecology, Civil Engineer: construction and infrastructure, Industrial engineering, Chemical engineering, Genetics and molecular Biology, Geosciences, Applied Mathematics.
Human resources in strategic areas

**Project name**
Cooperation with institutions of Italy for qualification of Human Resources in strategic areas

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Italy. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: University of Bologna, Universita Pisa, Università degli Studi di Perugia, Escuela Superior Sant'Anna, Università degli Studi di Roma "Tor Vergata", Università Ca' Foscari, Università degli Studi di Padova, Università del Salento, Politecnico di Milano. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Political Science, Biological Sciences - physiology, Rural development, Economy, Nursing, International strategic studies, Philosophy, Biology, Geosciences, Applied Mathematics, Sociology, Zootechny

**Project name**
Cooperation with institutions of Argentina for qualification of Human Resources in Strategic Areas

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Argentina. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: Universidad de Buenos Aires, Universidad Nacional de Cordoba, Universidad Nacional de Cuyo. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Communication, Rural development, Genetics and molecular Biology, Geosciences, Dentistry

**Project name**
Cooperation with institutions of Norway for qualification of Human Resources in Strategic Areas

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Norway. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: Antwerp University, University of Ghent, Vrije Universiteit Brussel. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Communication, Rural development, Genetics and molecular Biology, Geosciences, Dentistry

**Project name**
Cooperation with institutions of Belgium for qualification of Human resources in strategic areas

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Belgium. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: Aarhus University, University of Uppsala, University of Helsinki, Aalto University, University of Chile, University of Amsterdam, KTH, Universidad de Antioquia, University of Gothenburg, University of Zurich, Universität Bern, Umea University, Pontificia Universidad Católica de Chile, Lund University, Universidad Nacional de Colombia. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Botany, Communication, International strategic studies, Philosophy, Genetics and molecular Biology, Zootechny

**Project name**
Cooperation with institutions in Sweden, Switzerland, Denmark, Finland, Chile and Colombia for qualification of human resources in strategic areas

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Sweden, Switzerland, Denmark, Finland, Chile and Colombia. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: Wageningen University, Vrije Universiteit Amsterdam, University of Groningen, University of Maastricht. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Rural development, International strategic studies

**Project name**
Cooperation with institutions of the Netherlands for qualification of Human Resources in Strategic Areas

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with the Netherlands. The studies are concentrated on education of human resource at a high level, qualified to examine issues and designing projects and policies of technological, historical, social, cultural and institutional character that may lead Brazil to a new paradigm of sustainable development, linked to the aggregation of knowledge in all sectors of society. The target universities are: Wageningen University, Vrije Universiteit Amsterdam, University of Groningen, University of Maastricht. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are:
Projects OF INTERNATIONAL COOPERATION

Project name
Cooperation with institutions of Norway for Research on new technologies
Start date: 01/08/2018          End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Norway. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: University of Oslo. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Computing, Communication, Dentistry

Project name
Cooperation with institutions from Argentina for Research on new technologies
Start date: 01/08/2018          End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Argentina. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: Beijing Technology and Business University, Peking University, China Agricultural University, Aarhus University, Nanjing Agricultural University, University of Uppsala, ITMO University, Moscow Institute of Physics and Technology, HSE, Saint Petersburg State University, KTH, University of Southern Denmark, Umeå University, Lund University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Education, History, Language and literature, Agricultural Agricultural and environmental microbiology, Social psychology, Sociology

Project name
Cooperation with institutions from Denmark, Sweden, Russia and China for research on new technologies
Start date: 01/08/2018          End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Denmark, Sweden, Russia and China. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: Beijing Technology and Business University, Peking University, China Agricultural University, Aarhus University, Nanjing Agricultural University, University of Uppsala, ITMO University, Moscow Institute of Physics and Technology, HSE, Saint Petersburg State University, KTH, University of Southern Denmark, Umeå University, Lund University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Computing, Industrial engineering, Genetics and molecular Biology, Dentistry, Hydric Resources, Sociology

Project name
Cooperation with institutions of France for Research on new technologies
Start date: 01/08/2018          End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with France. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: Université de Lorraine, Université Paris Dauphine, Université de Grenoble Alpes, Université Pierre et Marie Curie, Grenoble-INP, INSA, Université de Lille, Université Paris Descartes, Université Paris 7 Denis Diderot, Université Paris 1 Panthéon-Sorbonne, Université Paul-Valéry Montpellier 3, Université de Montpellier, Toulouse Université Paul Sabatier 3. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Molecular and cellular Biology, Computing, Design, Industrial engineering, Mechanical engineering, Chemical engineering, Physics, Epidemiology, Genetics and molecular Biology, history, Language and literature, Microelectronics, Hydric Resources, Sociology

Project name
Cooperation with institutions of Germany for Research on new technologies
Start date: 01/08/2018          End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Germany. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: University of Hanover, Justus-Liebig-Universität Giessen, Universität Siegen, University of Duisburg-Essen, Technische Universität Darmstadt, Aachen University, University of Dortmund, Universität Würzburg, Universität Tübingen, Universität Bonn, Karlsruhe Institute of Technology, Ruhr-Universität Bochum, Univ. of Paderborn, Ruprecht-Karls Universität Heidelberg. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Cellular and molecular Biology, Computing, Communication, Mechanical engineering, Chemical engineering, Genetics and molecular Biology, History, Microelectronics, Dentistry, Hydric resources
Project name: Cooperation with institutions of the United States for research on new technologies  
Start date: 01/08/2018  
End Date: 30/06/2022

Description: This project contemplates the expansion of the international cooperation with the United States. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: Harvard University, University of California, Northeastern University, Rice University, Texas A&M University, University of Miami, Stanford University, University of Texas, University of Massachusetts, Massachusetts Institute of Technology, Rutgers University, University of Florida, Duke University, North Carolina State University, Ohio State University, Carnegie Mellon University, University of Connecticut, Dartmouth College, University of Virginia, Washington University St Louis, Case Western Reserve University, Brown University, Arizona State University, Vanderbilt University, University of Illinois at Chicago, University of Michigan, the University of madison-wisconsin, Auburn University, University of Colorado.

UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Cellular and molecular Biology, Computing, Education, Civil Engineer: construction and infrastructure, Industrial engineering, Mechanical engineering, Chemical engineering, Genetics and molecular Biology, History, Agricultural and environmental microbiology, Microelectronics, Dentistry, Social psychology, Chemistry, Hydric resources, Remote Sensing.

Project name: Cooperation with institutions of Australia and New Zealand for research on new technologies  
Start date: 01/08/2018  
End Date: 30/06/2022

Description: This project contemplates the expansion of the international cooperation with Australia and New Zealand. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: University of Melbourne, University of Western Australia, Griffith University, University of Queensland, University of South Australia, University of Sydney, Newcastle University and University of Auckland. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Chemical engineering, Language and literature, Dentistry, Social psychology, Sociology resources.

Project name: Cooperation with institutions of the Netherlands for Research on new technologies  
Start date: 01/08/2018  
End Date: 30/06/2022

Description: This project contemplates the expansion of the international cooperation with the Netherlands. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: University of Alberta, University of Laval, University of British Columbia, Université de Montréal. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Computing, Civil Engineer: construction and infrastructure, Genetics and molecular Biology, Psychology, Hydric resources.

Project name: Cooperation with institutions in Portugal for Research on new technologies  
Start date: 01/08/2018  
End Date: 30/06/2022

Description: This project contemplates the expansion of the international cooperation with Portugal. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: University of Coimbra, Universidade do Algarve, Universidade Nova de Lisboa, Universidade do Minho, Porto University, University of behind-the-Montes and Alto Douro. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Social anthropology, Biological Sciences - physiology, Communication, Education, Civil Engineer: construction and infrastructure, Chemical engineering, History, Agricultural Agricultural and environmental microbiology, Social psychology.

Project name: Cooperation with institutions of Italy for Research on new technologies  
Start date: 01/08/2018  
End Date: 30/06/2022

Description: This project contemplates the expansion of the international cooperation with Italy. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: University of Bologna, Politecnico di Torino, Trento, Sapienza Universita di Roma, Politecnico di Milano, University of Parma. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Computing, Industrial engineering, Mechanical engineering, Sociology.

Project name: Cooperation with institutions in the United Kingdom for Research on new technologies  
Start date: 01/08/2018  
End Date: 30/06/2022

Description: This project contemplates the expansion of the international cooperation with the United Kingdom. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: University of Exeter, University of Nottingham, University of Lancaster, University of Sheffield, University of Huddersfield, University of Nottingham, University of Manchester, Queen Mary University of London, London School of Economics, King's College London, University of Bristol and University of Edinburgh. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Performing arts, Cellular and molecular Biology, Computing, Civil Engineer: construction and infrastructure, Industrial engineering, Physics, Genetics and molecular Biology, Psychology, Hydric resources.
**Project name**
Cooperation with institutions of Spain for Research on new technologies

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Spain. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: Universitat Politècnica de València, Universidad Carlos III de Madrid, Universidade Autónoma de Barcelona, Universitat Rovira i Virgili, Universidad de Sevilla, Universitat Politècnica de Catalunya, Universidad Autónoma de Madrid, Universidad de Valencia. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Computing, Communication, Civil Engineer: construction and infrastructure, Mechanical engineering, Chemical engineering, Social psychology, Hydric Resources, Remote Sensing, Sociology.

**Project name**
Cooperation with institutions of Belgium for Research on new technologies

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Belgium. The studies focus on the impact, development, access to and integration of new technologies, artificial intelligence, information technologies and robotics in the future of work. The target universities are: Université catholique de Louvain, University of Ghent, Vrije Universiteit Brussel. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Communication, Industrial engineering, Mechanical engineering, Genetics and molecular Biology, Microelectronics.

**Theme**
**7. FOOD CHAIN AND AGRICULTURE, AND FOOD SAFETY.**

**Projects OF INTERNATIONAL COOPERATION**

**Project name**
Cooperation with institutions in the United States for research and development of food supply chains

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with the United States. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: Harvard University, University of California, Ohio University, University of Maryland, University of Minnesota, University of Illinois at Chicago, Texas A&M University, Duke University, North Carolina State University, Rutgers University, Ohio State University, Carnegie Mellon University, University of Connecticut, Texas Tech University, Dartmouth College, University of Virginia, Washington University St Louis, Case Western Reserve University, Vanderbilt University, Brown University, University of Florida, Auburn University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Cellular and molecular Biology, Soil Science, Biological Sciences - physiology, Veterinary Science, Mechanical engineering, Chemical engineering, Biology, Genetics and molecular Biology, Agricultural and environmental microbiology, Public policies, Hydric Resources, Zootechny.

**Cooperation with institutions of Germany for Research and development of food supply chains**

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Germany. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: Universität Kiel, Technische Universität München, Universität Siegen, University of Duisburg-Essen, Technische Universität Darmstadt, Aachen University, University of Dortmund, University of Hanover, Universität Würzburg, Universität Tübingen, Universität Bonn, Karlruhe Institute of Technology, Freie Universität Berlin. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Cellular and molecular Biology, Botany, Soil Science, Ecology, Mechanical engineering, Chemical engineering, Genetics and molecular Biology, Public policies, Hydric Resources, Zootechny.

**Project name**
Cooperation with institutions of Italy for research and Development of food supply chains

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Italy. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: University of Bologna, Università Pisa, University of Parma, Politecnico di Milano. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Mechanical engineering, Biology, Sociology, Zootechny.

**Project name**
Cooperation with institutions of Spain for Research and development of food supply chains

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Spain. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: Universidad de Sevilla, Universitat Politècnica de Catalunya and Universitat Politècnica de València, Universidad Complutense de Madrid, Universitat Rovira i Virgili, Universidad Autónoma de Barcelona. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Soil Science, Mechanical engineering, Chemical engineering, Biology, Public policies, Hydric Resources, Sociology, Zootechny.
Project name: Cooperation with institutions of the Netherlands, Sweden, Switzerland, Belgium and the Czech Republic for research and development of food supply chains
Start date: 01/08/2018   End date: 30/06/2022
Description: This project contemplates the expansion of the international cooperation with the Netherlands, Sweden, Switzerland, Belgium and the Czech Republic. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: Antwerp University, University of Uppsala, Wageningen University, University of Ghent, Umeå University, Vrije Universiteit Brussel, University of Groningen, Lund University, University of Zurich, Universität Bern and University of Chile. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Botany, Soil Science, Food science and technology, Mechanical engineering, Genetics and molecular Biology, Chemistry, Hydric Resources, Zootechny

Project name: Cooperation with institutions in Canada for Research and development of food supply chains
Start date: 01/08/2018   End date: 30/06/2022
Description: This project contemplates the expansion of the international cooperation with Canada. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: University of Laval, University of Alberta, Université de Montréal, University of Victoria, Queen's University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The post-graduate programs involved are: Agribusiness, Soil Science, Chemical engineering, Public policies, Chemistry, Hydric Resources, Sociology

Project name: Cooperation with institutions from Argentina for Research and development of food supply chain
Start date: 01/08/2018   End date: 30/06/2022
Description: This project contemplates the expansion of the international cooperation with Argentina. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: Universidad de Buenos Aires, Universidad Nacional de Córdoba, Universitat Granada Institute of Technology. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Agribusiness

Project name: Cooperation with institutions of China and India for Research and development of food supply chain
Start date: 01/08/2018   End date: 30/06/2022
Description: This project contemplates the expansion of the international cooperation with China and India. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: Beijing Technology and Business University, Peking University, China Agricultural University, Nanjing Agricultural University and Indira Gandhi Institute of Technology. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness

Project name: Cooperation with institutions of France for Research and development of food supply chains
Start date: 01/08/2018   End date: 30/06/2022
Description: This project contemplates the expansion of the international cooperation with France. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: Université de Lorraine, Université Paris Dauphine, Université Grenoble Alpes, Université de Poitiers, Grenoble-INP, INSA, Université de Lille, Université Paris Descartes, Université Paris 7 Denis Diderot, Université Pierre et Marie Curie, Université Paris 1 Panthéon-Sorbonne, Université Paul Sabatier, Toulouse 3 Université de Montpellier. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Botany, Soil Science, Agricultural and environmental microbiology, Sociology, Zootechny

Project name: Cooperation with institutions from Australia for research and development of food supply chains
Start date: 01/08/2018   End date: 30/06/2022
Description: This project contemplates the expansion of the international cooperation with Australia. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: University of Laval, University of Alberta, Université de Montréal, University of Victoria, Queen's University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Botany, Soil Science, Food science and technology, Mechanical engineering, Genetics and molecular Biology, Chemistry, Hydric Resources, Sociology, Zootechny

Project name: Cooperation with institutions in the United Kingdom for research and development of food supply chains
Start date: 01/08/2018   End date: 30/06/2022
Description: This project contemplates the expansion of the international cooperation with the United Kingdom. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: University of Exeter, University of East Anglia, University of Nottingham, University of Manchester, Queen Mary University of London, University of Bristol, University of Edinburgh, University of Aberdeen, Bangor University and University of Cardiff. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Cellular and molecular Biology, Botany, Ecology, Mining Engineering, met. and materials, Physics, Genetics and molecular Biology, Hydric resources

Project name: Cooperation with institutions of the United States for Research and development of food supply chain
Start date: 01/08/2018   End date: 30/06/2022
Description: This project contemplates the expansion of the international cooperation with the United States. The studies are concentrated in the food supply chain and agriculture, and food safety. The target universities are: University of California, University of Arizona, University of Illinois, University of Texas, University of California. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Botany, Soil Science, Food science and technology, Mechanical engineering, Genetics and molecular Biology, Chemistry, Hydric Resources, Zootechny
Theme
5. ENERGY FOR THE FUTURE, NEW FUELS, NON-POLLUTING AND/OR RECYCLABLE

Projects of International Cooperation

Project Name: Cooperation with institutions of the United States for research addressing energies of the future
Start Date: 01/08/2018  End Date: 30/06/2022

Description:
This project contemplates the expansion of the international cooperation with the United States. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: Harvard University, University of California, Ohio University, Stanford University, University of Texas, Duke University, North Carolina State University, Rutgers University, Ohio State University, Carnegie Mellon University, University of Connecticut, University of Florida, Arizona State University, Vanderbilt University, Auburn University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Social anthropology, Botany, Ecology, Chemical engineering, Agricultural and environmental microbiology, Public policies.

Project Name: Cooperation with institutions of China and India for research addressing energies of the future
Start Date: 01/08/2018  End Date: 30/06/2022

Description:
This project contemplates the expansion of the international cooperation with China and India. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: Beijing Technology and Business University, Peking University, China Agricultural University, Nanjing Agricultural University and Indira Gandhi Institute of Technology. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Civil Engineer: construction and infrastructure, Mechanical engineering, Chemical engineering, Geosciences, Microelectronics, Hydric Resources.

Project Name: Cooperation with institutions of the Germany for research addressing energies of the future
Start Date: 01/08/2018  End Date: 30/06/2022

Description:
This project contemplates the expansion of the international cooperation with Germany. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: Universität Siegen, University of Duisburg-Essen, Technische Universität Darmstadt, Aachen University, University of Dortmund, University of Hanover, University of Muenster, Friedrich-Alexander-Universität. Technische Universität München, Univ. of Paderborn, Karlsruhe Institute of Technology, Universität Tübingen. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness.

Project Name: Cooperation with institutions of France for research addressing energies of the future
Start Date: 01/08/2018  End Date: 30/06/2022

Description:
This project contemplates the expansion of the international cooperation with France. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: Université de Lorraine, Université Paris Dauphine, Université de Grenoble Alpes, Grenoble-INP, INSA, Université de Lille, Université Paris 7 Denis Diderot, Université de Poitiers, Université de Montpellier, Toulouse Université Paul Sabatier 3. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Computing, Design, Mechanical engineering, Chemical engineering, Physics and Geosciences, Microelectronics, Hydric Resources.

Project Name: Cooperation with institutions of Canada for research addressing energies of the future
Start Date: 01/08/2018  End Date: 30/06/2022

Description:
This project contemplates the expansion of the international cooperation with Canada. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: University of Laval, University of Victoria, University of Alberta. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Agribusiness, Materials sciences, Chemical engineering, Chemistry, Hydric Resources.

Project Name: Cooperation with institutions of the Netherlands, Argentina, Portugal, Sweden and Belgium for research addressing energies of the future
Start Date: 01/08/2018  End Date: 30/06/2022

Description:
This project contemplates the expansion of the international cooperation with the Netherlands, Belgium, Portugal, Sweden and Belgium. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: Antwerp University, University of Uppsala, Wageningen University, Universidad de Buenos Aires, KTH, University of Minho, University of Groningen, University of Coimbra, University of Ghent, University of Porto, KU Leuven, Universidad Nacional de Cordoba, Lund University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Civil Engineer: construction and infrastructure, Mechanical engineering, Chemical engineering, Microelectronics, Chemistry, Hydric Resources.
This project contemplates the expansion of the international cooperation with Australia. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: University of Melbourne, University of Queensland, University of Western Australia, Flinders University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Civil Engineer: construction and infrastructure, Chemical engineering, Geosciences

**Project name**  
Cooperation with institutions of the United Kingdom for research addressing energies of the future

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**  
This project contemplates the expansion of the international cooperation with the United Kingdom. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: University of Exeter, University of Sheffield, University of Huddersfield, University of Nottingham, University of Bristol. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Civil engineering: construction and infrastructure, Mining engineering, met and materials, Physics, Chemistry, Hydric Resources

**Project name**  
Cooperation with institutions of Australia for research addressing energies of the future

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**  
This project contemplates the expansion of the international cooperation with Australia. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: Beijing Technology and Business University, Peking University, China Agricultural University, Nanjing Agricultural University, Xi’an University of Architecture & Technology, Hong Kong Polytechnic University, and Indira Gandhi Institute of Technology. UFRGS already works in cooperation with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Mechanical engineering, Chemical engineering, Public policies, Hydric Resources

**Project name**  
Cooperation with institutions of Spain for research addressing energies of the future

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**  
This project contemplates the expansion of the international cooperation with Spain. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: Universitat Rovira i Virgili, Universidad de Sevilla, Universitat Politècnica de Catalunya, Universidad de Murcia, University of Valencia. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Civil engineer: construction and infrastructure, Chemical engineering, Geosciences

**Theme**

**6. SMART CITIES, COMPLEX URBANIZATIONS, INDUSTRY 4.0 AND CIRCULAR ECONOMY**

**Projects of International Cooperation**

**Project name**  
Cooperation with institutions in Portugal for studies on smart cities

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**  
This project contemplates the expansion of the international cooperation with Portugal. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: University of Coimbra, Universidade Nova de Lisboa, Universidade do Minho, University of Porto. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Social anthropology, economics, Civil Engineer: construction and infrastructure, Chemical engineering, History, Public policies

**Project name**  
Cooperation with institutions of Germany for studies on smart cities

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**  
This project contemplates the expansion of the international cooperation with Germany. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: Universität Siegen, University of Duisburg-Essen, Technische Universität Dortmund, Aachen University, University of Dortmund, University of Hanover, Ruhr-Universität Bochum, Univ. of Paderborn, Karlsruhe Institute of Technology, Technische Universität Berlin, Freie Universität Berlin. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Chemical engineering, Mechanical engineering, History, Microelectronics, Urban planning, Public policies, Hydric Resources

**Project name**  
Cooperation with institutions of Spain for studies on smart cities

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**  
This project contemplates the expansion of the international cooperation with Spain. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: Universitat Rovira i Virgili, Universidad de Sevilla, Universitat Politècnica de Catalunya, Universidad Autonoma de Barcelona. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Mechanical engineering, Chemical engineering, History, Microelectronics, Urban planning, Public policies, Hydric Resources

**Project name**  
Cooperation with institutions of China and India for studies on smart cities

**Start date:** 01/08/2018  
**End Date:** 30/06/2022

**Description**  
This project contemplates the expansion of the international cooperation with China and India. The studies focus on energy for the future, new fuels, including recyclable. The target universities are: University of Beijing, Tsinghua University, Beijing Technology and Business University, Peking University, China Agricultural University, Nanjing Agricultural University, Xi’an University of Architecture & Technology, Hong Kong Polytechnic University, and Indira Gandhi Institute of Technology. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Civil Engineer: construction and infrastructure, Chemical engineering, Public policies, Hydric Resources, Sociology
collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The post-graduate programs involved are: Administration, Architecture, Civil engineering: construction and infrastructure

**Project name**
Cooperation with institutions of the Netherlands, Sweden, Belgium and Chile for studies on smart cities

**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with the Netherlands, Sweden, Belgium and the Czech Republic. The studies are concentrated on smart cities, complex urbanizations, industry 4.0 and circular economy. The target universities are: Antwerp University, University of Uppsala, Lund University, Vrije Universiteit Amsterdam, Pontificia Universidad Católica de Chile, University of Groningen, University of Ghent, KU Leuven, University of Chile, Wageningen University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume of this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Architecture, Economy, Civil engineering: construction and infrastructure, Industrial engineering, Mechanical engineering, Microelectronics, Hydric Resources

**Project name**
Cooperation with institutions in the United Kingdom for studies on smart cities

**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with the United Kingdom. The studies are concentrated on smart cities, complex urbanizations, industry 4.0 and circular economy. The target universities are: University of Exeter, University of Essex, University of Kent, London School of Economics, University of Cambridge, University of Sheffield, University of Huddersfield, University of Leeds, University College London, University of Nottingham, University of Bristol. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Economy, Civil engineering: construction and infrastructure, Mining engineering, met and materials, Industrial engineering, Physics, Urban planning, Hydric Resources

**Project name**
Cooperation with institutions of Italy for Studies on smart cities

**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Italy. The studies are concentrated on smart cities, complex urbanizations, industry 4.0 and circular economy. The target universities are: University of Bologna, Escuela Superior San Anna, Université des études di Bergamo, University of Parma, Politecnico di Milano, Sapienza University of Rome. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Business Administration, Economics, Industrial engineering, Mechanical engineering, Urban planning, Sociology

**Project name**
Cooperation with institutions in Canada for Studies on smart cities

**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Canada. The studies are concentrated on smart cities, complex urbanizations, industry 4.0 and circular economy. The target universities are: McMaster University, University of Calgary, University of Alberta, Université de Montréal, University of Laval. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Economy, Industrial engineering, Chemical engineering, Public policies, Hydric Resources, Sociology

**Project name**
Cooperation with institutions of the United States for studies on smart cities

**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with the United States. The studies are concentrated on smart cities, complex urbanizations, industry 4.0 and circular economy. The target universities are: Harvard University, University of California, Brown University, University of Pennsylvania, University of Illinois at Chicago, Stanford University, University of Texas, University of Pittsburgh, University of South Carolina, University of Berkeley, Duke University, North Carolina State University, Rutgers University, Ohio State University, Carnegie Mellon University, University of Connecticut, Arizona State University, Vanderbilt University, Massachusetts Institute of Technology, Texas A&M University, University of Florida, Auburn University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Social anthropology, Computing, Economy, Civil engineering: construction and infrastructure, Industrial engineering, Mechanical engineering, Chemical engineering, History, Microelectronics, Urban planning. Public policies, Hydric Resources, Sociology

**Project name**
Cooperation with institutions of France for Studies on smart cities

**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with France. The studies are concentrated on smart cities, complex urbanizations, industry 4.0 and circular economy. The target universities are: Université de Lorraine, Université Paris Dauphine, Université de Grenoble Alpes, Université Pierre et Marie Curie, Grenoble-INP, INS, Université de Lille, Université Paris Descartes, Université Paris 7 Denis Diderot, Université Paris 1 Panthéon-Sorbonne, Université de Montpellier. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Computing, design, Mechanical engineering, Chemical engineering, Epidemiology, Physics, History, Microelectronics, Urban planning. Public policies, Hydric Resources, Sociology

**Project name**
Cooperation with institutions of Australia for studies on smart cities

**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Australia. The studies are concentrated on smart cities, complex urbanizations, industry 4.0 and circular economy. The target universities are: University of Melbourne, University of Western Australia, University of Queensland. UFRGS already works in collaboration with
these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Civil engineering: construction and urban planning, Ecology, Hydrology resources, Remote Sensing, Zootechny

**Theme**

1. SUSTAINABLE DEVELOPMENT; DIVERSITY; CLIMATE CHANGE; INTERNATIONAL COOPERATION; ENVIRONMENTAL, SOCIAL AND ECONOMIC SUSTAINABILITY, INCLUDING HISTORICAL, POLITICAL, CULTURAL, ETHICAL AND LEGAL ASPECTS

**Projects Of INTERNATIONAL COOPERATION**

**Project name**
Cooperation with institutions in the United States for research on sustainable development
**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with the United States. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: Harvard University, University of California, Ohio University, Columbia University, University of Michigan, University of Texas, University of Florida, University of Maryland, University of Illinois at Chicago, University of California, Stanford University, University of Texas, Ohio State University, Carnegie Mellon University, University of Connecticut, Rutgers University, Denver University, University of Notre Dame, St. Louis University, Cornell University, Georgetown University, University of Chicago, Penn State, Princeton University, the University of California, New York University, University of Pennsylvania, Texas A&M University, Texas Tech University, Dartmouth College, Virginia Tech, University of Virginia, Washington University St Louis, Case Western Reserve University, University of Colorado, Brown University, Massachusetts Institute of Technology, Vanderbilt University, Auburn University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Architecture, Animal Biology, Cellular and molecular Biology, Soil Science, Political Science, Biological Sciences - physiology, Economy, Education, Eng. Civil construction and infrastructure, Chemical engineering, International strategic studies, Philosophy, Biology, Genetics and molecular Biology, Geosciences, History, Literature, Urban planning, Public policies, Chemistry, Hydric resources, Remote Sensing, Zootechny

**Project name**
Cooperation with institutions of Italy for research on Sustainable development
**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Italy. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: University of Bologna, University Pisa, University degli Studi di Perugia, Escuela Superior de Sant Anna, Politecnico di Milano, Università Ca Foscari, Università degli Studi di Padova, Università del Salento, Sapienza Università di Roma. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The target universities are: Universitat Politècnica de Catalunya, Università Complutense de Madrid, Universidad Carlos III de Madrid, Universidad Autónoma de Barcelona, Universitat Politècnica de Valencia, Universidad Autónoma de Madrid, Universität Rovira i Virgili, Universidad Pompeu Fabra, Universidad de Valencia. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Architecture, Soil Science, Political Science, Communication, Rural development, Economy, Civil engineering: construction and infrastructure, Chemical engineering, Philosophy, Biology, Chemistry, Public policies, Hydric Resources, Remote Sensing, Sociology, Zootechny

**Project name**
Cooperation with institutions of France for research on Sustainable development
**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with France. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: Université de Lorraine, Université Paris Dauphine, Université de Grenoble Alpes, Université Paris Descartes, Aix-Marseille Université, Université Normale Supérieure de Cachan, Université Paris 1 Panthéon-Sorbonne, Université de Lille, Grenoble-INP, Université Paul-Sabatier, École Normale Supérieure, Université de Bourgogne, Université Paris 7 Denis Diderot, Université Pierre et Marie Curie, Université de Toulouse, Université de Strasbourg, Toulouse 3 Université Paul Sabatier, Université de Montpellier. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Social anthropology, Visual arts, Cellular and molecular Biology, Botany, Soil Science, Political Science, Materials science, Computing, Design, Ecology, Chemical engineering, International strategic studies, Philosophy, Physics, Genetics and molecular Biology, Geosciences, History, Urban planning, Public policies, Chemistry, Hydric Resources, Sociology, Zootechny

**Project name**
Cooperation with institutions of Germany for research on Sustainable development
**Start date:** 01/08/2018  **End Date:** 30/06/2022

**Description**
This project contemplates the expansion of the international cooperation with Germany. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: Universität Kiel, Technische Universität München, Universität Mannheim, Justus-Liebig-Universität Gießen, Technische Universität Darmstadt, Aachen University, University of Dortmund, University of Hanover, University of Duisburg-Essen, Universität Hamburg, Goethe Universität, Humboldt-Universität, Berlin, Ludwig-Maximilians-Universität, Universität Bonn, Freie Universität Berlin, Universität Würzburg, Universität Tübingen, Karlsruhe Institute of Technology, the University of Muenster, Friedrich-Alexander- Universität, Ruhr-Universität Bochum, Technische Universität Berlin. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The postgraduate programs involved are: Cellular and molecular Biology, Botany, Soil Science, Political Science, Communication, Rural development, Ecology, Chemical engineering, International strategic studies, Philosophy, Genetics and molecular Biology, Geosciences, History, Urban planning, Public policies, Hydric Resources, Zootechny

**Project name**
Cooperation with institutions in the United Kingdom for research on sustainable development
Project name
Cooperation with institutions of Portugal for research on Sustainable development
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Portugal. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: Universidade Nova de Lisboa, Universidade do Minho, University of Porto, Universidade de Aveiro. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Social anthropology, Botany, Biological Sciences - physiology, Communication, Ecology, Economy, Education, Civil Engineer: construction and infrastructure, Industrial engineering, Chemical engineering, Philosophy, History, Public policies, Chemistry

Project name
Cooperation with institutions of Argentina for research on Sustainable development
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Argentina. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: University of Coimbra, Universidade do Algarve, Universidade Nova de Lisboa, Universidade do Minho, University of Porto, Universidade de Aveiro. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Agribusiness, Botany, Soil Science, Materials sciences, Rural development, Education, Philosophy, History, Sociology, Zootecnia

Project name
Cooperation with institutions of the Netherlands for research on Sustainable development
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with the Netherlands. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: Wageningen University, Vrije Universiteit Amsterdam, University of Groningen. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Agribusiness, Science and tec. Food, Economy, Civil engineering: construction and infrastructure, Industrial engineering, Genetics and molecular Biology, Public policies, Hydric Resources

Project name
Cooperation with institutions of Belgium for research on Sustainable development
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Belgium. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: University of Ghent, KU Leuven, Vrije Universiteit Brussel. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The post- graduate programs involved are: Administration, Botany, Communication, International strategic studies, Philosophy, Genetics and molecular Biology, Zootecnia

Project name
Cooperation with institutions in Australia for research on Sustainable development
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Australia. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: University of Melbourne, University of Queensland, University of Western Australia, University of South Australia, University of Sydney, James Cook University, University of Newcastle, Flinders University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Ecology, Civil Engineer: construction and infrastructure, Chemical engineering, Genetics and molecular Biology, Geosciences

Project name
Cooperation with institutions in Canada for research on Sustainable development
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Canada. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: University of British Columbia, University of Toronto, University of Alberta, University of British Columbia, University of Western Ontario, University of Montreal, University of British Columbia, University of Regina, University of Victoria. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Ecology, Civil Engineer: construction and infrastructure, Chemical engineering, Genetics and molecular Biology, Geosciences
Description
This project contemplates the expansion of the international cooperation with Canada. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: University of Victoria, Simon Fraser University, University of Victoria, Queen's University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administratin, Agribusiness, Rural development, International strategic studies.

Project name
Cooperation with Canada's institutions for research on Sustainable development
Start date: 01/08/2022
End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with China. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: Beijing Technology and Business University, Peking University, China Agricultural University, Nanjing Agricultural University, Beijing Foreign Studies University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Agribusiness, Rural development, International strategic studies.

Project name
Cooperation with China's institutions for research on Sustainable development
Start date: 01/08/2022
End Date: 30/06/2022

Theme
2. INTEGRATION AMONG BASIC SCIENCE, INFORMATION TECHNOLOGY, ENGINEERING, ARTS AND MATHEMATICS [STEAM]

Projects OF INTERNATIONAL COOPERATION

Project name
Cooperation with institutions of Denmark, Norway, Sweden, Switzerland and Finland for research on sustainable development
Start date: 01/08/2022
End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Denmark, Norway, Sweden, Switzerland and Finland. The studies focus on sustainable development, diversity, climate change, environmental, social and economic sustainability, including historical, political, cultural, ethical and legal issues. The target universities are: Aarhus University, University of Uppsala, University of Helsinki, Aalto University, University of Southern Denmark, University of Gothenburg, Umeå University, Arctic University of Norway, Lund University, University of Zurich and Universität Bern. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administratin, Agribusiness, Botany, Communication, Rural development, Industrial engineering, Philosophy, Genetics and molecular Biology, Geosciences, Hydric Resources.

Project name
Cooperation with institutions from Australia for Studies on STEAM integration
Start date: 01/08/2022
End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Australia. The studies are concentrated on integration among basic science, information technology, engineering, arts and mathematics [STEAM]. The target universities are: University of Melbourne, University of Western Australia, University of Queensland, Flinders University, Monash University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Medical Sciences - Endocrinology, Chemical engineering, Geosciences, Applied Mathematics.

Project name
Cooperation with institutions of the United States for studies on STEAM integration
Start date: 01/08/2022
End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with the United States. The studies are concentrated on integration among basic science, information technology, engineering, arts and mathematics [STEAM]. The target universities are: Harvard University, University of California, University of Washington, Duke University, University of Miami, University of Colorado, Ohio State University, Carnegie Mellon University, University of Connecticut, Rutgers University, University of Florida, Brown University, University of Missouri, Clemson University, North Carolina State University, Arizona State University, Vanderbilt University, Case Western Reserve University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Medical Sciences - Endocrinology, Chemical engineering, Geosciences, Language and literature, Applied Mathematics, Microelectronics, Chemistry, Hydric Resources.

Project name
Cooperation with institutions of the United Kingdom for studies on STEAM integration
Start date: 01/08/2022
End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with the United Kingdom. The studies are concentrated on integration among basic science, information technology, engineering, arts and mathematics [STEAM]. The target universities are: University of Exeter, University of Bristol, City University of London, University of Nottingham, University of Southampton, University of Hull. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The postgraduate programs involved are: Administration, Medical Sciences - Endocrinology, Computing, Physics, Chemistry, Hydric Resources.
This project contemplates the expansion of the international cooperation with Sweden, China, Spain, Netherlands and Belgium. The studies are concentrated on integration among basic science, information technology, engineering, arts and mathematics [STEAM]. The target universities are: University of Toronto, University of Alberta, University of Waterloo, University of Victoria, Queen's University, McGill University, University of Laval. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Administration, Medical Sciences - Endocrinology, Chemical engineering, Microelectronics, Chemistry, Hydric Resources
Projects OF INTERNATIONAL COOPERATION

Theme
4. HEALTH SCIENCES IN LARGE SCALE, TRANSLATIONAL MEDICINE AND ITS SOCIO- ECONOMIC IMPACT

Project name
Cooperation with institutions in the United States for large-scale studies in the area of Health Sciences
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with the United States. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: University of Georgia, Princeton University, Brown University, University of Michigan, Yale University, University of Pennsylvania, Johns Hopkins University, Harvard University, Georgia State University, University of Florida, University of California, University of Washington, Duke University, University of Miami, University of Colorado, University of Iowa, University of Minnesota, Stanford University, University of California, Berkeley, Carnegie Mellon University, University of Connecticut, Rutgers University, Dartmouth College, University of Virginia, Washington University St Louis, Case Western Reserve University, Arizona State University, Vanderbilt University, University of Illinois at Chicago, New York University. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Social anthropology, Cellular and molecular Biology, biochemistry, Cardiology, Biological Sciences - pharmacology, Pharmaceutical Sciences, Medical Sciences, Medical Sciences - Endocrinology, nursing, Civil Engineer: construction and infrastructure, Chemical engineering, Genetics and molecular Biology, Microelectronics, Neuroscience, Dentistry, Public policies, Psychiatry, Child and adolescent health

Project name
Cooperation with institutions in the United Kingdom for large-scale studies in the area of the Health Sciences
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with the United Kingdom. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: King’s College London, Queen Mary University of London, University of Nottingham, University College London, University of Manchester, University of Bristol, University of East Anglia, University of Sheffield, University of Huddersfield, University of Liverpool and Manchester. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Social anthropology, Cellular and molecular Biology, biochemistry, pharmacology, Biological Sciences - biology, Pharmacology, Pharmaceutical Sciences, Medical Sciences, Medical Sciences - Endocrinology, Ecology, Civil Engineer: construction and infrastructure, Physics, Genetics and molecular Biology, Neuroscience, Psychiatry, Child and adolescent health

Project name
Cooperation with institutions of France for large-scale studies in the area of Health Sciences
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with France. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: Université Paris-Sud, Université de Rennes, Université de Grenoble Alpes, Grenoble-INP, Université de Poitiers, Université de Lille, Université Paris Descartes, Université Paris 7 Denis Diderot, Université Pierre et Marie Curie, Université de Montpellier, Université Paris 1 Panthéon-Sorbonne. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Biochemistry, Biological Sciences - pharmacology, Pharmaceutical Sciences, Medical Sciences - Endocrinology, Nursing, Genetics and molecular Biology, Microelectronics, Computing, Design, Ecology, Chemical Engineering, Physics, Epidemiology, Genetics and molecular Biology, Microelectronics, Neuroscience, Public policies

Project name
Cooperation with institutions of Belgium, Italy and Austria for large-scale studies in the area of the Health Science
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Belgium, Italy and Austria. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: University of Ferrara, Università degli Studi di Perugia, Università Wien, University of Pampa, Vrije Universiteit Brussel, Università degli Studi di Roma "Tor Vergata", KU Leuven. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Cellular and molecular Biology, Pharmacological Sciences, Medical Sciences - Endocrinology, Nursing, Genetics and molecular Biology, Microelectronics

Project name
Cooperation with institutions of Germany for large-scale studies in the area of the Health Sciences
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Germany. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: Friedrich-Alexander-Universität, Karlsruhe Institute of Technology, Universität Kiel, Technische Universität München, Technische Universität Darmstadt, Aachen University, University of Dortmund, University of Hanover, University of Duisburg-Essen, Universität Würzburg, Universität Tübingen, Universität Bonn, Universität Hamburg, Univ. of Paderborn, Ruprecht-Karls Universität Heidelberg, Freie Universität Berlin. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Cellular and molecular Biology, Biochemistry, Computing, Ecology, Chemical engineering, Genetics and molecular Biology, Microelectronics, Dentistry, Public policies

Project name
Cooperation with institutions of Australia and New Zealand for large scale studies in the area of Health Sciences
Start date: 01/08/2018  End Date: 30/06/2022

Description
This project contemplates the expansion of the international cooperation with Australia and New Zealand. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: University of Newcastle, University of Queensland, University of Western Australia, University of Melbourne, University of South Australia, University of Sydney and the University of Auckland. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Biochemistry, Pharmaceutical Sciences, Medical Sciences - Endocrinology, Ecology, Civil Engineer: construction and infrastructure, Chemical engineering, Genetics and molecular Biology

Project name
Cooperation with institutions of Spain for large scale studies in the area of Health Sciences
Start date: 01/08/2018  End Date: 30/06/2022

117
Description
This project contemplates the expansion of the international cooperation with Spain. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: Universidad Autónoma de Madrid, Universidad de Santiago de Compostela, Universidad de Barcelona, Universidad de Granada, Universidad de Navarra, Universitat Rovira i Virgili, Universidad de Sevilla, Universitat Politècnica de Catalunya, Universidad Complutense de Madrid. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Biochemistry, Biological Sciences - pharmacology, Pharmaceutical Sciences, Medical Sciences, Nursing, Civil Engineer: construction and infrastructure, Chemical engineering, Public policies, Psychiatry, Child and adolescent health.

Project name
Cooperation with institutions in Portugal for large scale studies in the area of Health Sciences
Start date: 01/08/2018 End Date: 30/06/2022
Description
This project contemplates the expansion of the international cooperation with Portugal. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: University of Coimbra, University of Minho, New University of Lisbon, University of Porto. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Social anthropology, Biochemistry, Medical Sciences, Ecology, Nursing, Civil Engineer: construction and infrastructure, Chemical engineering, Public policies.

Project name
Cooperation with institutions in Canada for large scale studies in the area of Health Sciences
Start date: 01/08/2018 End Date: 30/06/2022
Description
This project contemplates the expansion of the international cooperation with Canada. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: McGill University, McMaster University, University of Toronto, University of Manitoba, University of Western Ontario, University of British Columbia, University of Alberta, University of Ottawa, Queen's University, Université de Montréal. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Biochemistry, Cardiology, Biological Sciences - pharmacology, Biological Sciences - physiology, Medical Sciences, Medical Sciences - Endocrinology, Computing, Nursing, Chemical engineering, Neuroscience, Dentistry, Public policies, psychology, psychiatry, Child and adolescent health.

Project name
Cooperation with institutions of Norway for large scale studies in the area of Health Sciences
Start date: 01/08/2018 End Date: 30/06/2022
Description
This project contemplates the expansion of the international cooperation with Norway. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: University of Oslo. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Genetics and molecular Biology, Dentistry.

Project name
Cooperation with institutions of the Netherlands for large scale studies in the area of Health Sciences
Start date: 01/08/2018 End Date: 30/06/2022
Description
This project contemplates the expansion of the international cooperation with the Netherlands. The studies are concentrated on health sciences in large scale, translational medicine and its socioeconomic impact. The target universities are: University of Groningen, University of Maastricht. UFRGS already works in collaboration with these universities, and this project will enable us to strengthen and expand in scope and volume this interaction. They are recognized universities in the areas of interest, well positioned in international rankings. The graduate programs involved are: Biochemistry, Medical Sciences, Civil Engineer: construction and infrastructure, Genetics and molecular Biology.
1. **Internationalization of the curriculum - Incorporation of international themes in undergraduate and graduate classes.**

The UFRGS’ Institutional Internationalization Project is integrated into a larger context of internationalization of the whole university, going beyond the graduate and research dimension; it is being conceived in tandem with the internalization of undergraduate studies and extension activities. The IIP aims at (a) the expansion of graduate courses (and also of undergraduate courses) given in foreign languages, and (b) the integration of internationalization and innovation themes in graduate and undergraduate curricula and in extension activities. To this goal, UFRGS will count on its structural departments of UFRGS: the Secretary for International Relationships, Vice-Presidency for Student Affairs (as well as other academic Vice-Presidencies). Since their respective inceptions, they have acquired organizational and technical capabilities to attend to the internationalization of the curriculum. As the IIP is distributed among eight great themes, it is expected that these will be the subjects of topics to be integrated in the formal academic graduate and undergraduate curricula.

2. **Production of international publicity material in other languages, including course websites.**

The majority of the Graduate Programs of UFRGS have websites in foreign languages. Their expansion to ever more languages is part of the agreement of the graduate programs in participating in the Institutional Internationalization Project. During the four years of duration of the IIP, UFRGS will materials specific to the project and to the international activities of the university in general, aiming at expanding their visibility across international communities and to give witness to the development of the various stages of the Project.

3. **Training and qualification of staff for institutional internationalization.**

Since a few years ago, UFRGS has its own School for the Development of Employees of Universidade Federal do Rio Grande do Sul (EDUFRGS). The School offers courses which meet various expectations of UFRGS’ employees, including courses on foreign languages – English, French, Italian, and Spanish – and qualifications on many aspects of the internationalization of Brazilian and foreign universities. There are full conditions to further the offering of courses for the specific needs of the Institutional Internationalization Project, mainly in its aspects of preparing personnel for the needs of the inbound mobility and for the aid to the graduate programs that are part of the IIP. The Secretary for International Relationships and the EDUFRGS are already working together to attend to the various aspects of the university's internationalization process. In this respect, UFRGS is a leader among Brazilian academic institutions. During the four years of duration of the IIP, it is expected courses to be conducted...
regularly, in view of needs that may arise due to the increased international visibility of the University.

4. **Counterparts offered by foreign partnership institutions, when applicable.**

As a highly internationalized institution, UFRGS has taken part (and been awarded) in international calls. The university has current actions with 364 universities of 38 countries. For its greater part, these actions have been formalized through agreements what include financial and academic counterparts (as the exemption of registration taxes, for example) from foreign institutions. The deepening of these actions with foreign universities is expected during the duration of the Project, as well as the creation of new actions – always through formal documents processed through the Office of Institutional Agreements and the Office of International Affairs. It is expected that these new actions will have the same sort of counterparts that are typical of the academic milieu, in agreement with the terms of the Project and with the financial aid, where applicable, of the foreign partner.

5. **Other counterparts, when applicable.**

Non-applicable in this moment of inception of UFRGS’ Institutional Internationalization Project.