



University of São Paulo

USP Institutional Assessment
2010 - 2014

School: Institute of Mathematics and Statistics (IME)



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SET OF INTENTIONS

Mission

1.1.1 What is the School's mission?

R: The mission of the Institute of Mathematics and Statistics is to achieve excellence in research in Mathematical Sciences and its applications, to provide high level undergraduate and postgraduate education and, through its various extension activities, to spread scientific knowledge, to foment its applications and to help to improve the quality of precollege education in society at large. We aim to train professionals who will be able to perform at top ranking industrial, academic and teaching positions all over the country. We also aim to collaborate with the basic Mathematical training of students in more than 20 institutes or other academic units of the University of São Paulo, being in charge of roughly 25 thousand enrollments in courses per year.

1.1.2 Is the mission disseminated to professors, employees, and students and implemented in the School?

R: Yes, the mission is disseminated by institutional actions, as stipulated by the statutes of the University and of the Institute, defined within the sphere of action of each committee. Beyond those official actions, knowledge about our mission is also spread through professional interaction among faculty, students and staff and through the daily acknowledgement of academic values consolidated during the many decades of the Institute's existence.

Vision

1.2.1 What is the School's vision?

R: Our view is that the knowledge necessary to face contemporary challenges can no longer be comprised by a single academic discipline. Major scientific and industrial projects are becoming increasingly more complex and often require special expertise to be addressed. We understand that the training of professionals with solid mathematical skills who are able to interact with experts in other fields should be our priority and the main focus of our efforts in teaching and extension. Hiring of foreigners as members of our faculty and collaboration with foreign institutions in research projects are current trends that should be ever more encouraged, as a means of speeding the process of acquiring and introducing in our country recent developments, as well as exporting our own achievements.

1.2.2 Is the vision disseminated to professors, employees, and students and implemented in the School?

R: Our vision is continuously disseminated through various specific institutional actions and, indirectly, through daily academic convivence. It is worth mentioning the annual freshman reception week, organized by the students (with support from the administration and faculty members), essential to introduce the newcomers to the vision and the academic values of the Institute.

Educational proposal



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1.3.1 What is the School's educational proposal?

R: The Institute is in charge of five bachelor degree programs and of the teacher education program. Each of these programs has its own specific proposal, as explained in the intention reports of the four departments comprised by the Institute. They all share the belief that the students must receive a solid and robust mathematical training, that this will allow our them to adapt to technological changes and to interact in multidisciplinary teams

1.3.2 Is the educational proposal disseminated to professors, employees and students and implemented in the School?

R: The Institute strives for its educational views to be known and assimilated by all, so that all faculty members, students and staff can be fully engaged in their academic activities, as well as in committee and open meetings.

SELF ASSESSMENT

Management

2.1.1 Assess the School's academic-administrative organization.

R: The Institute is organized according to the rules expressed in the statutes of the University of São Paulo, as well as its own statute. Besides the committees expressly determined by those statutes, there are more than 40 other internal committees that rule over academic, administrative and financial matters. Typically not only faculty members belong to those committees, but also students and administrative staff.

2.1.2 Describe the School's administrative policies and management model (goals, standards and indicators).

R: Our management model gives support to students, faculty members and administrative staff to maintain the standards of academic freedom and autonomy and political pluralism, with the main aim of executing high quality actions in teaching, research and extension. The Institute encourages its faculty members to engage in administrative work, and good number of them do engage in those tasks. The indicators we use are: number of graduates, the proportion of enrolled students who don't graduate, number of students doing exchange abroad, number of publications in refereed international journals, follow-up of graduates. We have actions to help students to graduate in the expected time. We always try to reach consensual decisions and evaluate the merit and competence of the staff

2.1.3 List new management practices implemented in the School in recent years and analyze the impact of these practices on core activities and administrative activities.

R: (1) The Institute has fully engaged in the efforts to internationalize the University, helping our students to spend time in foreign universities and hosting short and long term visits of scholars from abroad. Mathematicians and scientists from all over the world give talks in our research seminars and our faculty and graduate students are strongly encouraged to participate in research congresses and workshops. Our undergraduate and postgraduate educational programs have been restructured and we have hired foreign applicants in tenure-track and full-professor positions. (2) With regard to administrative practices, we have implanted a system to record prices of supplies and an annual calendar of bidding for furniture and computational equipment; we have outsourced services of gardening. (3) We renovated classrooms and labs. (4) Near the end of 2011, with the restructuring of IME's organization chart, the Institutional



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Support Service (SVAPIN) was created, with the following responsibilities: website administration, analysis and development of administrative support systems; communication management, media relations and public relations; publication of the internal newsletter, and publications in other media; supervision of Digital Production Section's activities.

2.1.4 How does the School manage budget resources and extra-budget resources?

R: The execution of the core budget of the Institute is overseen by an advisory body of the Technical and Administrative Council, the Budget and Patrimony Committee, composed of the following members: the director, the deputy director, representatives from each of the departments, from the Undergraduate Commission, from the Postgraduate Commission and a student representative. In 2011 it was created the Financial Technical Assistance, which advises the director in making everyday decisions and heads the Accounting Service, the Treasury, the Material Section, the Purchases Section, the Bidding and Contracts Service and the Section of Projects and Agreements. This last section advises faculty members in the preparation and execution of extra-budgetary projects.

2.1.5 Comment on the School's streamlining/optimization policies or existing resources (e.g. cost reduction and revenue generation).

R: The concern with the rational management of resources is constant and permeates all our spending decisions. We can cite as examples the following measures: we reduced from four to two the number of official vehicles of the Institute; we standardized furniture and printers to reduce maintenance costs; we adopted the system of registered prices (bid valid for one year, which guarantees a maximum price, but does not prevent us from seeking a lower price) for the purchase of consumables.

2.1.6 I identify the School's actions in regard to environmental sustainability for the rational use of consumer goods and natural resources (e.g., water and electricity), as well as the management and treatment of effluents and waste (chemical, biological, radioactive, and recyclable, among others).

R: The more recently acquired air conditioners use the inverter technology, which could reduce up to 60% energy consumption. They also come with a government regulated stamp certifying that their energy consumption is low. Flow reducers have been installed on restroom and kitchen faucets, including those that feed toilet flushes. During weekends 60% of the restrooms remain closed. During certain night hours some hall lights are turned off. There are stickers at every power switch reminding the user to turn it off when leaving the room; also on computer screens and air conditioners there are similar signs. We strictly follow University regulations concerning the usage of paper and toner cartridges and the recycling of batteries and waste in general.

2.1.7 Comment on how appropriate the School's academic and administrative information systems are.

R: All academic and administrative information systems provided by the University are fully used by the Institute, which considers them to be adequate to our needs. The computing power of the machines in our labs has been kept up-to-date. Since the 1970's, the faculty of the Department of Computer Science decisively contributes to the development of the University information systems, some of them in leading positions. It is worth mentioning their role in the creation of Moodle (paca.ime.usp.br), a system that gives support to all courses of the Institute. The main objectives of the Center for Competence in Free Software (CCSL), directly subordinated to the direction of the Institute, are: to develop scientific and technological research related to free software, to develop new free software, and to disseminate



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knowledge about free software. Scholarships are offered to selected undergraduate students who then take part in the development of the CCSL projects. The Institute also has the Center for the Teaching of Computer Science (CEC) whose main objective is to provide technical and pedagogical services to all of the University, and even the society at large. Among those services provided by CEC, we mention: curricular and extracurricular courses to USP students, extension courses, assignment of equipment and space for teaching activities, providing consultancy and advice about teaching activities that require the use of computers. The service of the Institute's library is automated. Besides the search engine provided by the University, the library also uses the Colmeia, a system developed by faculty and students of IME, with a more flexible search device and allowing the storage of more detailed information.

A new wired network was installed in the two older and bigger buildings of the Instituto, "Blocos A and B", using cat6 structured cabling, with 1507 connectors, which can be used for both data transmission and telephone service. After the renovation, we were able to replace all networking hardware (switches and router), enabling a safer and easier network management, as well as a more stable network service. All 8 network racks were connected by optic fiber cabling to the main router (at room 131-A), which improved network performance. Each rack has a 24-port gigabit switch connected to the main router by an optic cable, and connects itself to the other switches in the rack by UTP gigabit ports, enabling a better transmission speed. The external link was upgraded from 1 Gigabit to 10 Gigabits. At room 7, B building, we have a video conference room, allowing use of the IPTV broadcast and conference service.

Connections and cooperation

2.2.1 Analyze the connections and cooperation established with internal and external entities to achieve academic goals, considering the following different levels:

a) among the School's departments, academic committees and academic support boards (centers, others);

R: All departments have active and assiduous members in committees and bodies of support, at the Institute or at the University levels. The unifying discussion of the various academic goals takes place usually at the Congregation of the Institute and at the Councils of the Departments. At the beginning of each meeting of the Congregation, its representative at the University Council as well as the presidents of the four statutory committees (Graduate Education, Postgraduate Education, Research and Culture and Extension), which are permanent members of the congregation, are invited to talk about relevant issues in their fields. Although the four academic graduate programs are traditionally or historically linked to the Departments, some faculty members, depending on their research interests, engage with more than one graduate program. The Professional Masters in Teaching of Mathematics has emerged as an interdepartmental project, although with predominant participation of the Department of Mathematics. The Centre for Diffusion and Education MATEMATECA, though formally directly subordinated to the director, has links with the Departments of Applied Mathematics and Mathematics.

b) among core activities (undergraduate and graduate programs, research, culture and extension);

R: The Institute annually receives 340 new undergraduate students, as well as graduated students who do course work without aiming a Master's or Doctorate degree. In 2014 we had 101 entrants in the master's degree program, and received 59 new PhD students. It is probably unnecessary to describe how the postgraduate education is linked with research activities; it is the very nature of graduate school that students collaborate on research projects of their supervisors. Undergraduate education and research activities are integrated mainly through the Scientific Initiation programs, which introduces students to concepts and more advanced methods usually not seen in regular undergraduate courses, including, or at least having in mind, topics current research. The training of undergraduate students and the extension



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activities of the Institute are closely linked in at least two actions: some of the "Licenciatura" students (students aiming a Mathematics teacher degree, fulfilling requirements established in 2009) work as trainees in public schools under the supervision of teachers who, in turn, take extension courses at IME, and so our trainee-students participate in the implementation of projects that originate in those extension courses; students of the final year of Bachelor's in Statistics participate in activities in the Applied Statistics Center-CEA of the Institute; the statistical analysis services they provide to the community, including master's degree or doctoral research projects in other fields, often serve as the basis for the monographs they have to write as part of their degree requirements. The graduate seminars are open and undergraduate students are encouraged to participate. Graduate students develop activities in the Education Improvement Program-PAE, working as assistants to undergraduate education. Some of them also teach extension courses at the annual Summer School of IME.

c) with other teaching and research Schools, specialized institutes, complementary boards and/or entities associated with the University, if it is the case;

R: The Institute has great interaction with other departments and institutes of the University, being in charge of teaching freshman and sophomore classes to more than 20 other institutes each semester, with an average of 25 thousand enrollments per year. The Statistics Department usually invites people from other Institutes to give talks to local faculty and students. The Department of Applied Mathematics participates in the administrative and academic management of the Molecular Sciences Bachelor's program, in partnership with other bodies of the University. There is much research interaction with the ICMC- Institute of Mathematical Sciences and Computation, the IF - Institute of Physics and the IAG - Institute of Astronomy, Geophysics and Atmospheric Sciences and recently with the School of Public Health, in the field of Epidemiology. Recently there has been a lot of interaction with the Politechnical School because of changes in their curriculum, resulting in changes of the syllabus of Numerical Calculus courses. The IME is one of the seven Institutes of USP (distributed in 4 cities) that make up the Interunit Graduate Program in Bioinformatics.

d) with other institutions in Brazil and abroad (e.g., Multidisciplinary Master and Doctoral Programs between two Schools, Undergraduate and Graduate dual degree programs, involvement of students and professors in scholarly exchanges, cooperation agreements, research networks, and integrated research projects, among others).

R: Our faculty can keep close contact with their research collaborators all over the world, through sabbatical semester and short leaves of absence and also hosting their frequent visits to IME to run research projects. We have signed numerous agreements of academic cooperation, especially with European or American universities and joint degree agreements, especially with French universities. Many PhD students perform research abroad during the preparation of their theses. The Institute's graduate programs have given support to the consolidation of other graduate programs in the country, through the Procad program, Capes. The CAEM has collaborated with the State Secretary of Education in carrying out technical guidance meetings of pedagogical coordinators from all over the State of São Paulo and in running workshops for students who have qualified for the second phase of the Public School Mathematical Olympiad.

Infrastructure

2.3.1 Briefly comment on the development of School infrastructure in recent years, identifying, in relevant cases, difficulties that hinder improvement of the School's academic standards (e.g., in regard to physical area, classrooms, study rooms, faculty offices, libraries, specific laboratories and multi-user laboratories, access to computers, living areas, leisure and food



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areas, among other possible issues).

R: (1) Construction and occupation of the building of the Competence Center for Free Software -CCSL (see section 2.1.7). (2) In collaboration with the technical staff of IME, the University's Office for Physical Space has developed a master plan and the basic design of a new future building for the Institute, which should, in the long term, solve our chronic problem of lack of space. It is already in the bidding stage (the executive project has already been approved in all instances) the reconstruction of the old cafeteria space, which will house a smaller cafeteria, so the space can also be used as convivial and exhibition environment. (3) Building renovation in the last five years: Restrooms and floors; Platform installation for handicapped; Mounting and installation of equipment for the Studio and videoconferencing room for classes at a distance; Total renovation of 8 classrooms; Installation of a new wired network (see Section 2.1.7); Exterior painting; Readjustment of the dependencies as a whole aiming the use of the building by handicapped; Partial renewal of computer park.

Technical and administrative employees

2.4.1 Does the School have a specific system (goals, indicators, performance standards) to assess the activities of technical and administrative employees, in addition to the institutionalized processes outside the School?

R: Each boss observes the performance and interest of the staff member and adequates their functions to their abilities.

2.4.2 Report the School's policies concerning the improvement of technical and administrative employees in regard to:

a) Integration of recently hired employees;

R: The section that receives the new server is responsible to present he or she to the other sections and to instruct the server with all the information about procedures and daily tasks of the work he or she will perform. The routines and norms of the professional life are instructed by the Human Resources from IME.

USP should have an introductory training to all the recently hired employees, instructing their duties and rights. However, the Institute does not have such kind of training, internally. What we have today are trainings to act on the different platforms of the Corporate Systems of the Universities, given by the University Rectory directly to the servers who will work with this kind of job, either a new hire or not. The Institute encourages its servers to seek courses, congresses and activities of continued formation that are offered by different institutions of the University like, for instance, the USP School of capacitation, by the Fundap, online by the website of the Brazilian Legislative Institute in partnership with the Senate and the UFMG, among others.

b) Incentives for professional improvement;

R: The Institute has a Committee of Training and Development formed by elected servers who represent all the areas of performance of the Institute. This committee is responsible for researching and hiring courses and lectures "in company" with the purpose to attend the highest number of employees, besides analysing all the requests of courses and trainings elaborated by server to what concerns their fields of performance, stimulating whenever possible the participation. There are yet the online language courses of Basic English 1 and Basic Spanish 1, offered by Aucani Languages for undergraduate and post-graduation (masters and doctorate) students, docents and employees of USP, totally free of charges. The



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course is available for 24 hours a day, 7 days a week, awaiting the access of the student, who sets the pace of study. We also have English courses for employees of USP in the Interdepartmental Center of Languages in FFLCH/USP which are paid by the Institute, through request of the employees, and it is sited at <http://www.ime.usp.br/~gis/treinamento/>

The employees are encouraged to seek for an ever increasing professional improvement, either by congresses, lectures, courses (including of languages), informatics, writing or the specifically focused on the duties performed by the employees, like the courses on the different platforms for the corporative systems of the University.

c) Criteria for career development;

R: As the Institute has no autonomy to reposition its employees, it has no specific performance evaluation process in IME, what happens with our servers when command observes the skills, qualities and capacities of the employees or the latter manifests towards a possibility of relocation in the same or in other institute of interest, as a way to encourage and learning with new challenges, besides also using the Institutional Evaluation criteria of the University.

d) Institutional engagement.

R: Usually, the Institute has the policy of, in case the new hired server do not adapt to the section he or she was designated for, offering a new opportunity to fit in other section, many chances are given so that the employees may have a good engagement inside the Institute. The servers are extremely professional and engaged in their tasks and have received all the trust of their commanders, either docents or non-docent servers. The Institute also disseminates to its servers the academic values of the sector linked to the importance of their activities.

Faculty members

2.5.1 Analyze the progress of the School's faculty profile on the basis of core activities developed in the last 5 years (hiring, career development, job contracts, and retirement, among others).

R: MAC (Department of Computer Science)

The last MAC hiring processes have been very competitive, resulting in excellent hires. Virtually all MAC faculty who applied to promotion were approved; despite of the fact the process was strongly based on academic criteria, not only the average rate of good quality publications were considered, but the existence of seminal articles as well, besides the evaluation of all other activities at the university. That resulted that, across the University, only 50% of computer science faculty were promoted. Only one of MAC's faculty members is not full time. Part of its retirees continues to cooperate with the Department in academic activities.

MAE (Department of Statistics)

The MAE has 39 fully active faculty members and four seniors (retirees with a collaboration plan). In the last five years, four faculty retired and 3 were hired. Not all faculty member applied for promotion in the recent Horizontal Progression process. Among those who did, most have been promoted. All faculty have a PhD degree and work full time for the University. Semiannually a public call for Associate Professorship is issued. We had two candidates in the last five years, both approved. The ration (number of full professors)/(number of faculty members) is 0.18. A public contest to hire a full professor was held in 2014 and there are two full professorship positions available. A policy of offering new positions, including full professor ones, is a necessity in the short and long term to maintain the desired quality standards.

MAP (Department of Applied Mathematics)

MAP hired eight faculty member between 2010 and 2014, 7 tenure-track assistant professors and one full



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professors. One faculty was accepted to work full time, and 3 faculty retired. The new hires brought more balance among the various research areas: the area of Optimization had been very depleted and that gap was bridged, and the areas of Numerical Analysis, Mathematical Modelling, Mathematical Physics, Evolution Equations, and PDEs and pseudodifferential operators were strengthened.

MAT (Department of Mathematics)

In the years 2010-2014, the number of MAT faculty members evolved as follows: 85-89-89-89-87. During this time, however, MAT had an increased workload due to the creation of new programs at USP, and consequently the increase of classes taught by the Department. In the years 2013-2014 were requested eight positions to replace retired faculty and layoffs, but none were awarded. Currently we have requested additional 3 new position to replace retirees. Several classes are overcrowded, and the high teaching load has been a challenge to our ability to keep the good standards of all the activities of the Department. The Department has 17 full professors, 20 associate professors, 46 assistant professors and two assistants.

2.5.2 Does the School have a policy concerning the hiring of professors (e.g., internationally published public notices)? Comment on how appropriate this policy is in regard to the School's profile and its development projects, including new areas such as attracting new talent for academic careers.

R: All our hiring positions are widely advertised and most of them allow the usage of English in the interviews and texts used to evaluate the applicants. High level committees are formed to select the candidates according to scientific and academic criteria. This policy has been very successful in selecting excellent candidates.

2.5.3 Describe the primary individual indicators concerning the quality of the work performed by the School's faculty.

R: For "horizontal" promotion, and for promotion to associate professor and full professor levels, the main factor are research papers publishes in refereed international journals with excellent editorial boards; awards, supervision of thesis, awards of their students, and courses taught. We emphasize, however, that the evaluation is not only quantitative, there is a great respect for the individual decisions of their faculty members. In general, they are expected to do a good teaching job, good research and/or extension and to bring financial resources to the Institute from agencies that support research.

2.5.4 In addition to the institutionalized assessment processes outside the School (CAPES - The Brazilian Agency for Coordination of Improvement of Higher Education Personnel, CNPq - National Council for Scientific and Technological Development, USP - Office of the Vice-President, CERT - The USP Especial Committee of Labour Work, and CPA - The USP Permanent Assessment Committee), does the School have a specific system to assess its faculty members' activities? If yes, what kind of work is developed?

R: There is no systematic institutionalized evaluation, besides those that are external to the Institute. The very academic environment of the Institute works, for the vast majority of faculty members, as a stimulus to the development of academic excellence activities. Only during career promotion, the Institute acts directly in evaluating the work of its faculty.

2.5.5 Does the School have a Pedagogical Support Group (PSG) or any type of pedagogical advisory program to support the work of professors? If yes, what is the work developed? Characterize the adherence of professors to the proposed activities.



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R: There is no institutionalized Pedagogical Support Group. For a few years, until the end of 2014, under the supervision of the pedagogical advisor of the Polytechnic School, Giuliano Salcas Olguin, and with the participation of trainees hired by the Institute, we conducted an assessment of most of the Institute's undergraduate courses, involving questionnaires, interviews and meetings with representatives of the students. For personal reasons, Dr. Giuliano resigned from his position as pedagogical advisor. We intend to resume that experience, but we face two obstacles: the difficulty to find the right person for the job and the lack of resources to hire him or her.

2.5.6 Report whether the School provides conditions for improving the teaching of the faculty body, analyzing its importance in regard to the existing educational proposal. If the School does, what are the activities developed? Comment on advancements and difficulties.

R: The Institute provides conditions for teaching improvement, praises and rewards the good initiatives in that direction. Many faculty produce didactical material of good quality, which is generally made available on their websites. Some publish or translate textbooks.

2.5.7 Provide information on the School's policy concerning the valorization and development of teaching careers in regard to:

a) Integration of recently hired professors;

R: There is no explicit policy of integration of the newly hired faculty. That integration happens quite naturally through interaction with the older members of each department. Small actions are made that help this integration, such as assigning newcomers as coworkers of more experience faculty in teams in charge of very large classes. We also seek to avoid, as far as possible, the assignment of new teachers to excessively demanding administrative tasks.

b) Incentives for improvement and post-doctoral programs;

R: The Institute supports and encourage scientific exchange of its faculty members, by allowing short and long period research paid leaves, including periods of up to two years for young PhDs.

c) Institutional engagement.

R: Our faculty members engage normally in academic and administrative committees, at the levels of Departments, Institute and University.

2.5.8 How important is the participation of professors in support centers, complementary boards or specialized institutes for the achievement of the School's goals?

R: Many faculty members participate in the activities of "support centers" and in highly prestigious projects such as Cepids and NAPs. They work in research management at FAPESP, CAPES and CNPq. The Institute also offers, through the Centre for Mathematics and Applied Computing, advisory service to the community. The Applied Statistics Center prepares statistical advisory projects for academic bodies, public administration and private companies. The CAEM develops continuing education activities and guidance for public school teachers with impact on the work of thousands of teachers, organizes on Saturdays training workshops for talented Mathematics public school student with good performance at OBMEP. The main objective of the Center MATEMATECA is the dissemination of mathematical information to the



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general public. In addition, some of our faculty are individually engaged with other institutions according to their academic interests, such as CEPETEC, Petrobras, IPEN, Public Health School, State Secretary of Health and Butantan Institute.

Teaching and learning processes

2.6.1 Assess the School's teaching and learning processes, including the teaching means and techniques and their coherence with the educational proposal.

R: The pedagogical strategies contemplate expository classes, practical classes, development of group activities, laboratory classes, availability of laboratories. The activities to be developed by the students must allow the daily use of computational equipments, the producing of bibliographical research, in multimedia or in the environment of the library, the reading and discussion of texts and the participation in the solving of specific problems. Usually, the Bachelors are courses that demand of the students many work hours outside classroom. Individual or group study of the topics discussed in classroom, the solving of exercise lists and making of works that demand statistical applications are demanded in almost all of the disciplines and are part of a necessary condition so that the student have a good performance. The Institute adopts modern techniques, such as videos, projections and computer demonstrations, or the old way with chalk and eraser. Each professor is free to define their style in each course he or she lectures. We have an example of success: The MATEMATECA, which has begun its activities in 2004 and was institutionalized in 2014 when it became a center. MATEMATECA has focused in developing different expographical proposals aiming the consolidation of a solid permanent exposition for public visitation. Today, Matemateca is the bigger and most complex collection of mathematical objects in Brazil and is a reference for other institutions.

2.6.2 Is the profile of Undergraduate and Graduate alumni used as reference to define teaching and learning processes? How so?

R: The sugestions of the egresses are used to adapt the syllabi of the different bachelors and the demands of post-graduation students serve as feedback for the undergraduate courses. Our undergraduate and post-graduation courses aim to form professionals of the highest technical standard, therefore, they are designed to reach this goal. Many of our egresses are hired in fovernment bodies, industries and in the financial market.

2.6.3 Describe the incentive policy intended to encourage the production and use of teaching materials (e.g. books, movies, videos, online material, software, prototypes, simulators and others) directed to the School's teaching in the Undergraduate and Graduate Programs.

R: There is no specific policy for the support to editing of books and other media directed to the teaching of Undergraduate and Post-Graduation studies. In a general way, this has been made in an not organized way by the groups of research of the Institute. The professors interested in projects of this kind can publish their work successfully. For instance, many docents of the Department of Mathematics/MAT develop and keep web pages of their disciplines with didactic material and information for the students. The Department has offered the course Calculus 3 online (distance education with presential tests) for students of the Escola Politécnica/EP that failed in the discipline, Besides that, the classes of the calculus discipline lectured at EP are being recorded by UNIVESP to be made available online. Regarding didactical materials for the Primary and Secondary School we point out the Center for Improvement of the Teaching of Mathematics/CAEM which has been making a good institutional divulge. These materias have been produced by docents of MAT at CAEM and through projects like the Program of Continued Education. We give another example: considerable didactic material has been produced by the docents. The material of introduction to computation is been produced and improved for over 20 years. The most recent version



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is available at <http://www.ime.usp.br/~macmulti/>. This material has webpages, exercises lists in pdf, solved exercises with explanation that use animated images and/or simulation on the computer. This material have free access and has been used in universities in Brazil since its launch 20 years ago. Besides, many courses have already generated materials that were published in the form of books (one of them received the Jabuti award of 2007). Other materials are made available online. The absolute majority of the undergraduate and post-graduation courses use our custom of the system reused in the following offering of the disciplines, generating a living memory of the courses. Some professors, by individual initiative, prepare notes of the classes and make them available online.

2.6.4 List the primary forms of academic assessment used in the School's Undergraduate and Graduate Programs.

R: In the undergraduate disciplines lectured in other institutes the evaluation process is made by the responsible of the course. It is important to mention that at the Escola Politécnica, where a reasonably constituted system was consolidated, the docents and the disciplines of the Department of Mathematics are very weel rated. For the Professional Master, it is used the procedures from CAPES and evaluations of the students. The Post-Graduation Committee of the Institute sets periodical meetings with students and professors, in which the results of the CAPES evaluation and ways of improving the Programs are analysed, so that it reflects on the negative and positive points of those.

In all the courses of the Institute the students are used to seek the committee or the alumni representative to talk and exchange ideas. This closer interaction with the students allows a reasonably efficient follow-up. The committees of courses, the alumni representatives and the docents that five classes end up bringing to the councils of the departments questions that deserve more attention.

2.6.5 In the School, is there any program encouraging technological innovation, entrepreneurship, or junior enterprises? Analyze the results.

R: There is a Junior Enterprise at IME called IME Jr, which is an company (with its own CNPJ registration) where students get in touch with entrepreneurship, its challenges and difficulties, in a controlled environment.

IMEJr congregates active students of the courses at IME, for instance, from the Bachelor in Statistics, for which the Department encourages the innovations, and the senior students face and are informed of the different possibilities in the contact with people of the diverse areas of performance for the egress in Statistics.

In the Laboratory of Computation of the Department of Applied Mathematics, students develop software and work with numerical calculus in bigger scales than in undergraduate disciplines. The Center in Free Software Competence/CCSL develops the program for fomentation of startups and the support for technical interactions with the national and international community in technological problems of great complexity.

Undergraduate program

2.7.1.1 Describe the primary advancements attained in the School's Undergraduate Program and the difficulties faced in the last 5 years.

R: The Institute has 7 undergraduate degrees: Bachelor (BA) of Mathematics (daytime); Mathematics Teaching (daytime), Mathematics Teaching (evening); BA of Mathematics; BA of Applied Mathematics; BA of Applied and Computational Mathematics; BA of Statistics and BA of Computer Science.

In 2012 the BA of Statistics underwent changes, its contents have been updated, important topics have been included and the teaching load has been increased. This process of change has been discussed among teachers and students. Thus the course became more dense and modern with a resulting decrease



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in dropout rates.

The course of BA of Applied Math. was consolidated and stabilized. Most of its students have finished the course in the correct period. Moreover, new qualifications are being introduced (Actuarial Science at FEA). Perhaps the greatest operational difficulty in this course is to set a timetable combining disciplines from different institutes.

The BA of Mathematics had changed its curriculum in order to better match the distribution of content and also to offer more flexibility regarding to optional courses. The courses of algebra had a rearrangement of content and so had the disciplines of differential geometry. There was a concern to offer an introductory course "Numbers" as early as in the 1st semester,

in order to acquaint the entrant with the rigor of mathematics. A reading-discipline "Scientific Initiation" was created and the number of elective

courses has increased. These changes were previously discussed with the students. During this period we consolidated the new curriculum of Math. Teaching, in force since 2006, and implemented the Internship Program required by law. Since 2009, as part of the Math. Teaching program, the MAT has been offering to the teachers of Mathematics Public Schools, annual courses (60 hours) performed concurrently with the compulsory subject undergraduate MAT1500 "Stage Projects".

Recently, the BA of Computer Sciences was updated. The modification of greatest impact was the establishment of the continuous assessment process with the direct participation of the students and the faculty. This activity allowed for greater integration between students and faculty. The effectiveness of the Competence Center for Free Software / CCSL and the growth of undergraduate research opportunities in advanced projects have helped in the training of students. The points of greatest difficulty are the average time for finishing the course, which exceeds the ideal for most students, followed by evasion.

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2.7.1.2 Characterize the connection and cooperation among the School's Undergraduate Committee and the Courses' Coordination Committees.

R: The Undergraduate Committee and Course Committees are in permanent contact with the four departments of the Institute and all decisions covering students have opinions of departments involved, either by being the department responsible for the course or by being the responsible for the discipline.

2.7.1.3 List the relevant innovations, initiatives, and tendencies in teaching of the School's Undergraduate Program in regard to:

a) New Programs and Courses;

R: The MAC did not create new undergraduate course but improved the current one. Elective courses were created and continually offered, reflecting current trends and the areas of research of the faculty. Lately, disciplines were created aimed at the market, specifically "Law and Free Software" and "Entrepreneurship".

The MAP introduced new qualifications and new courses, for example, the new major in Actuarial held by the Faculty of Economics and Administration (FEA). It should be noted the creation of the discipline "MAP 2001: Mathematics, Architecture and Design" of interdisciplinary character that has been successful in its two years of existence.

The courses of the MAT offered to other USP units had several adjustments at the request of them, particularly the "Escola Politécnica". Four disciplines of Algebra, offered to the Bachelor in Mathematics, have been replaced by four others with substantial modification and reorganization of menus (MAT see the report for details). A compulsory subject MAT0148 Introduction to Scientific Work was set up, annual discipline, counting 10 credits work for the student and with a workload of 300 hours. In the Mathematics Teaching some courses were introduced and others reformulated. We highlight the introduction of



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"Practice" as Curriculum Component.

In MAE, the Bachelor degree in Statistics has been reworked. Various courses that were optional became compulsory and other courses were created (see MAE report for details). It should be noted the creation of: MAE0125 "Perspectives in statistics", aimed to acquaint the student in the first semester of the types of problems and areas where a statistician can act, and MAC0313 "Introduction to Statistics for Database Systems", aimed to teach the student how to handle large databases, a nowadays requirement.

b) Increase in the number of slots;

R: There was no increase in vacancies in the last five years. This will only be possible after: to reduce the dropout rate and to solve the problem of lack of teachers. Per year there are approximately 15,000 enrollments of students from other units in IME courses, that for the 191 IME faculty members represents 79 [Outside enrollments] / [teacher-year]. Add to it 7 undergraduate degrees and 6 graduate degrees.

c) Attraction of talented students;

R: The IME attracts good students for the undergraduate "Scientific Initiation" program and to the graduate programs through its activities in the courses of the "Polytechnic School" and the "Molecular Sciences". Both courses have excellent students. The creation of a separate career for "Computer Science" in 2011, gave more visibility. The IME also get good students through its role in the OBMEP (Brazilian Mathematical Olympiad of Public Schools). We should also mention the "Job Fair", the exhibitions of MATEMATECA, and activities of the CEPID "Neuromat": all of them disseminate the courses and the research of IME to high school students.

d) Changes and flexibility in the curricular structure;

R: The Institute departments encourage their students to take a wide range of free elective-courses in other units of USP (IB, IAG, FEA, FE, FFLCH, EP, etc.). Under fulfillment of certain requirements, the Undergraduate Committee also accepts courses taken outside USP. This allows a certain flexibility in the curriculum. In IME there are very interdisciplinary courses. We cite, as an example, the courses offered by the MAP that are very flexible: ten majors are offered, from Animal Health to Control and Automation among several others. All IME courses allow the student to perform a large number of elective courses, most of which offered in the Institute itself. Details can be found in the reports of the departments.

e) Renewal, updating, and use of new teaching methodologies.

R: Various courses have support via internet, via Moodle, with discussion forums, remote delivery tasks and provision of teaching materials. A new initiative (MAC) is a circulating laboratory of robotics for the study of autonomous intelligent agents. There are some courses (MAT) being recorded by UNIVESP that made them available through the internet. Two Calculus courses are already available and two more are being recorded. The Undergraduate Committee revises (with an internal evaluation) the suggested bibliography and the proposed syllabus modifications.



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2.7.1.4 Characterize the monitoring of the School's Undergraduate teaching. Describe the procedures and indicators used in this process.

R: The monitoring process of the students performance depends on the course. By 2014, the formal monitoring through questionnaires and meetings between students, teachers, course coordinators and a pedagogical counselor, was implemented in the Bachelor of Statistics (MAE) and Bachelor of Computer Science (especially in the latter, see "Apoio ao BCC" in <http://bcc.ime.usp.br/principal/>). Informally, this monitoring is done at all the courses. In the courses with fewer students, Bachelor of Mathematics and MAP courses, monitoring occurs often personally by the actions of some teachers and course coordinators. One should also highlight that the participation of Student Representatives at meetings of Courses Coordinating Committees, departmental councils, Undergraduate Committees and Administrative Councils is encouraged and enables a quick follow-up of possible problems and difficulties encountered by students. Unfortunately, sometimes the students do not indicate such a representative. The assessment of the courses delivered in other USP units follow their own procedures.

2.7.2.1 What is the profile of Undergraduate alumni pursued by the School?

R: The Institute aims to train professionals to work in private companies, public agencies and schools; and also aims to prepare researchers for an academic career, who can hold master and doctorate degrees for future engagement in national and international universities and research centers. We seek an education of excellence that enables the graduated student to face whatever challenges he may experience in his future professional activities.

2.7.2.2 Are the courses syllabuses and subjects of the School's Undergraduate Program consistent with this profile?

R: Yes.

2.7.2.3 Are the School's teaching and learning processes consistent with this profile?

R: Yes.

2.7.2.4 Describe the socioeconomic characteristics of the School's Undergraduate students. Comment on the degree of representativeness of students from public schools, as well as that of students who reported being African-descendant, of mixed race, or indigenous, attending the School's courses.

R: According the data sent by FUVEST (an University foundation for students selection), from the 344 students that were engaged to IME in 2014: 151 (43.9%) came from the public high-school system; 104 (30.2%) came from the public elementary-and-high-school systems, and 52 (34.4%) declared themselves belonging to the PPI group (Black, Brown, Indigenous) having made high-school at a public school. We emphasize that these data refer to the freshmen.

2.7.2.5 Comment on the evolution of candidate/slot ratio in the Entrance Examination in the



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last 5 years observed in the School's programs.

R: Since 2010 the applicant/opening ratio of the IME had little variation, except for the course in Computer Science that had an increasing applicant/opening ratio, varying from 11.02 in 2010 to 41.00 in 2014. In 2014 the other courses had the following relation candidate/vacancy:
Bachelor of Mathematics 7:57, Mathematics Teaching (daytime) 8:26, Mathematics Teaching (evening) 3:52, Bachelor of Statistics 5.90,
Bachelor of Applied Mathematics (daytime) 3.40 and Bachelor of Applied and Computational Mathematics (evening) 4.66.

Does the School have policies to decrease dropout rates in its Programs? Comment.

R: The Institute does not have an special policy for decreasing dropout. But the four departments reported this problem in their reports. The MAE created the discipline MAE0125 offered in the 1st semester of the course in order to inform what types of statistical problems a statistician can solve and in which professional areas he can act. The MAC suggests that a possible way to reduce the dropout number is to "better select" the freshman students.

2.7.2.7 List the support services provided by the School to students.

R: In addition to the Undergraduate Students Office, which offers support to any academic subject, the several Courses Committees are several always available to help the students with academic questions. Regulatory information, particularly to newcomers, are given by the Courses Committees and by Undergraduate office of the University. The incoming students receive the IME Undergraduate Catalog (online at http://www.ime.usp.br/images/arquivos/grad/catalogo_2015.pdf). The Institute also provides a good IT-infrastructure and a good library.

2.7.2.8 Does the School have any system to monitor the training process of Undergraduate students? Comment.

R: The Undergraduate Committee has academic information about each student. The monitoring of his performance is done by the courses committees and, voluntarily, by some teachers. Note that, except for the courses in Mathematics Teaching, the IME courses do not have many students which facilitates the monitoring task. In addition in the MAC there is "Apoio ao BCC" (see <http://bcc.ime.usp.br/principal/>).

2.7.2.9 Indicate incentive actions intended to promote Scientific Training for Undergraduate Students, participation in studies and research groups, among others.

R: In recent years, an effort has been made in order to improve the students' participation in undergraduate research projects ("IC"). It was created a biannual event, the Undergraduate Research Symposium (Simpósio de Iniciação Científica), in which every student participating in some project is invited to give an oral presentation or presenting a poster of their work. A resume of each work presented in the symposium is published in a special volume with the conference proceedings, which makes the participation more attractive to both students and supervisors. In the undergraduate courses that have a final project the IC can be used for this purpose. This is also an attractive for some students. A student can do an IC with or without a scholarship.

2.7.2.10 Does the School have any formal relationship with Undergraduate alumni? Is there



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any system to maintain ties with Undergraduate alumni?

R: There is no formal monitoring system of the alumni. There are informal contacts via email and social networks, which has enabled an exchange of information with some students. Several students pursue their graduate studies at IME. They bring their professional information and also those from their colleagues. In addition, some alumni, who are professionally active, are invited to give talks to undergraduate students about labor market and job perspectives. In this context, MAE0125- "Perspectives in Statistics" has as one of its purposes to place graduates and students in touch.

2.7.2.11 Comment the professional practice fields and skills required by the School's alumni.

R: There are a wide variety of areas in which our graduates work in both the academy and in the labor market. In the case of mathematics and applied mathematics these area are: research in mathematics and applied mathematics, banking, engineering, financial market technology companies, ... and even journalism. Statistics graduates go to: research, banks, industries, hospitals, government agencies, financial system, judiciary, communications and marketing, energy and sanitation Companies, and so on. The Computer Science graduates work in: research, administrative activities and software development to be used at all levels, from personal computers to high performance systems. There are several graduates who set up their own businesses and others who work in large corporações as Google, Samsung and IBM. The graduates in Mathematics Teaching, in addition to acting as teachers in all levels of education, also occupy positions similar to those occupied by bachelors in mathematics and applied mathematics. All our alumni have skills to use quantitative and qualitative reasoning for: modeling, trouble shooting, and data analysis.

2.7.2.12 Comment on the performance of the School's alumni in professional exams, and exams from the medical field and similar contexts.

R: There are no Professional tests for our graduates.

2.7.3.1 Indicate whether there are initiatives concerning distance learning in the School.

R: There are distance learning courses offered to the students of the Polytechnic School (for example "MAP2121 Numerical Methods") who have already done the classroom course but who failed by grade and not by frequency. There are other projects being discussed in the IME departments. For example, there is a non-classroom course proposal in Mathematics Teaching and there is a developing web-course on "Introduction to Computation". Such initiatives are likely to be implemented soon.

2.7.3.2 Describe primary Undergraduate extra-curricular activities in the School.

R: Scientific initiation is one of the most important extracurricular activities. There are also teaching-assistant programs that are present in all courses. Besides helping the younger students, teaching assistance enables the integration between students of different years. Students are encouraged to participate in events and conferences in their area. There is also the Internship Program Curriculum for the Mathematics Teaching Degree, which began in 2009 and which enabled partnerships with Public Schools of the State and Municipais networks. There are also traineeships that are made by most students regardless of whether they are or not required for the course. The traineeships are held in the same locations (banks, software companies, etc ..) where graduates can be subsequently employed.

2.7.3.3 Comment on the impact for the Undergraduate Program from academic agreements,



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supervised training programs, and agreements with the public and private sectors, as maintained by the School.

R: The IME has 322 agreements for undergraduate internship in force, enabling the realization of traineeship in companies such as: Rodia, Itau (bank), Bradesco (bank), "Colégio Bandeirantes" (high school), Facebook, IBM, HSBC, "Colégio Albert Sabin" (high school), SAS Institute Brazil, among others. Currently there are 158 IME students doing internships in companies and 16 students doing internship internally (in IME itself). The Institute also has several international academic exchange agreements signed with foreign institutions. All these traineeships programs improve students skills especially those in the more practical aspects of the career.

2.7.3.4 Relate the School's main inter-disciplinary projects.

R: Almost all of the Institute's courses are interdisciplinary (see item 2.7.1.3d "Changes and Flexibility of the Curriculum"). There are different elective courses in several of the University institutes as, for instance, IB, IAG, FEA, FE, FFLCH, EP, among others. Among the interdisciplinary projects stand out those from the Applied Statistics Center (CEA), in which last year Statistics students participate with the guidance from the Department Faculty. During 2013 the CEA directed 29 projects and 17 consultations, and in 2014, there were 29 projects and 22 queries, all interdisciplinary. The page of the Competence Center for Open Source Software (<http://ccsl.ime.usp.br>) lists a number of interdisciplinary projects underway. There are also interdisciplinary projects in linguistics (<http://nehilp.org>), astrobiology, cancer, and medical imaging.

2.7.3.5 Describe the School's monitoring and tutoring programs.

R: The Institute has a teaching assistant program: on average are offered between 100 and 120 semi-annual scholarships, distributed among four departments, for undergraduates or graduate students to act as teaching assistants in undergraduate courses. Through a specific system, students can apply for a teaching assistant position in any discipline offered that semester. Conversely, teachers access the same system to ask for teaching assistants. The selection is made by the Teaching Assistance Committee, composed of one faculty representative from each department. The weekly working hours is 8 hours (on average) and the current value of the scholarship is R\$ 559.50 per month. There is also the "Stimulus Program for Undergraduate Education (PEEG)", under the sponsorship of the Dean of Undergraduate Studies, that, for instance, provided 17 scholarships to be used at IME on the second semester of 2015. Teachers interested in participating in this program apply for it in the "Jupiterweb system" (an USP computer system). The undergraduate students interested in participating in the program apply for it in the same Jupiterweb system. A letter of motivation must be included in the student's application. The selection is made by the a University Undergraduate Committee. The weekly workload is 10 hours and the current value of the scholarship is R \$ 400.00. The Institute does not have a tutoring program except for a MAC program for freshman that started in 2015.

Graduate program

2.8.1.1 Comment on innovations, initiatives and other relevant tendencies of the School's Graduate Programs in regard to:

a) New Programs, merger or division of old Programs;



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R: The Post-Graduation of the Institute has the following programs: Mathematics, Applied Mathematics, Computer Science, Estatística, Bioinformatics and Professional Master (which is a new program). The new program of Professional Master of Sciences in Mathematical Education (MP-MAT) has begun in 2012 and the first 11 students started to work in August of that year.

b) Professional Master's Program(s);

R: The MP-MAT has a total of 58 students which started work in 2012, 2013 and 2014 and 27 accredited supervisors. The 11 students who started in 2012 are already in the final phase of writing their dissertations.

c) Increased number of slots;

R: There is no fixed number of vacancies. For the period 2010-2014, the numbers of master's and doctoral students in the IME are:

Master 364 (2010), 336 (2011), 347 (2012), 367 (2013) and 366 (2014);

PhD 273 (2010), 322 (2011), 363 (2012), 354 (2013) and 363 (2014);

We emphasize that in the period 2010-2014 the number of students in the Doctoral Program in Bionformática doubled, from 18 to 36, and the number of students in the master's program increased from 20 to 26.

d) Changes and flexibility in the curricular structure;

R: The main changes were the creation of disciplines, including several short-courses delivered by visitant scholars most of them from abroad.

Regarding Program in Mathematics, the main change in the syllabi happened in 2011, when the Master had its deadline for dissertation delivery reduced from 44 to 36 months. This change had as its main goal the decrease of the average time of formation of the egresses from the Master. Though the change is relatively recent, the time of graduation in the Master has decreased from 36 (2005-2009) to 33 (2010-2014) months.

e) Flexibility and incentive(s) for its Graduate Programs to cooperate with other institutions and the society's productive sectors;

R: The articulation of the Programs of Post-Graduation of the Institutes with other Departments, Unities and Institutions is given above all through the interaction and collaboration of its members and students with external researches. This way, the encouragement to this articulation happens through the establishment of agreements of academic collaboration and research internships of students and docents. More details on academic agreements can be found in the departments reports. As an example, there is the Interinstitutional Doctorate program DINTER-CAPES of the Program in Computer Sciences with the Technical Federal University of Paraná (UTFPR), in the Campo Mourão campus, given that many students from UTFPR take disciplines at USP and also periodically professors of the program travel to Campo Mourão to offer disciplines. The Institute is the headquarter of The Bioinformatics interunities program. In this program the interaction with docents from other institutes and even with docents from outside USP is intense, including co-orientation activities for masters and doctorate students.

f) Readjustment of research projects and lines of research, so as to follow or encourage



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advancement in the field;

R: A good share of the post-graduation docents have an active collaboration with docents from other institutions, from home or abroad; this fact, along with the participation in congresses, allows the constant update of the knowledge of the docent body about the advances in the research fields. The projects and lines of research of the Institute are comprehensive and easily welcome the advances in their fields. Our programs are dynamic in a way that their research lines and projects are in constant readjustment.

g) Renewal, reformulation of courses (objectives, syllabuses, assessment, language, professors) and use of new teaching methodologies;

R: All the disciplines are reevaluated in a period of 5 years and, the ones not given in said period are automatically deactivated.

The Post-Graduation Program also have encouraged the docents of IME to request to some of their visitors to lecture minicourses of 10 hours in more specific themes, which give the opportunity of the students to get in touch with research themes of diverse mathematics areas. These minicourses usually are lectured in English.

h) Attention provided to the inclusion of professors who are provisional hires, especially those who need to extend this phase;

R: The docents in probation period are encouraged to accredit themselves in the Post-Graduation Programs of the Institute and to lecture disciplines. Those accredited in the Program of Professional Master have to get linked to some project, of which are attributed mentees to encourage their fast insertion in the program.

i) Others.

R: The Programs of IME have kept the same grades at the Evaluation CAPES, except for the MAC Program that went from 5 to 6.

2.8.1.2 What is the percentage of the School's professors linked to Graduate Programs?

R: In the Institute the average is of 74% of the docents participating in the Post-Graduation Programs.

2.8.1.3 How are the School's Graduate Programs assessed?

R: The content of the disciplines is analysed (with the help of referees) at the moment of its (re-)accrediting, following the Post-Graduation Regiment of USP. The evaluation of the program is made by Capes. The Coordination of the Post-Graduation Course (CCP) discusses periodically the problems of the Program and, eventually, suggests changes in its regiment, which passed through a complete review in 2014.

2.8.1.4 Analyze the performance of the School's Graduate Programs considering the last two assessments performed by CAPES.



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R: The programs in Mathematics (grade 6), Statistics (grade 7) and Bioinformatics (grade 4) remained with the same grades in the CAPES evaluation.

The grade of the Computer Science Program have increased from 5 to 6 and grade of the Program in Applied Mathematics have decreased from 5 to 4.

The Professional Master have obtained grade 4 in its first evaluation (this program began in 2012).

2.8.1.5 Note national and international awards and other indicators of quality received by the School's Graduate Programs in the last 5 years.

R: The MAT and MAC report no prizes during the period 2010-2014.

With respect to the MAC, we point out the awards received by docents and students in the program. Of those we mention: (1) in 2014 the student Phablo Moura, oriented by Professor Doctor Yoshiko Wakabayashi won first prize in the CLEI contest of Tesis y Maestría; (2) also, in 2014, the same student won an honorable mention in the master dissertation contest promoted by SBMAC; (3) in 2014, student Ewerton R. Andrade, oriented by Professor Doctor Routo Terada, received the award of best dissertation in the Contest of Theses and Dissertation of the Brazilian Symposium of Safety, SBSEG 2014; (4) yet in 2014, students Andre Casimiro, Marcos Brinzi and their mentor Professor Doctor João Eduardo Ferreira, received the award for best article of the Brazilian Symposium of Data Bank (SBBD 2014); (5) in 2013, student Leissi Margarita Castañeda León, oriented by Doctor Roberto Hirata Jr., won second place in the CLEI award of Tesis y Maestría; in 2012, professors Yoshiharu Kohayakawa and Yoshiko Wakabayashi were admitted as members in the ACIESP (Academy of Sciences of the State of São Paulo); (2) Award of best article of the WBMA 2012 for the Professor Alfredo Goldman vel Lejbman. (1) in 2011, the Gold Medal in the Innovation Olympics of USP by Professor Marco Aurélio Gerosa and the student Ana Paula Oliveira dos Santos by the project Archigraphy Brazil; (2) the admission of Professor Yoshiko Wakabayashi at the National Order of Scientific Merit (ONMC) in the class of Commander in 2010; (3) the award of Professor Fabio Kon by the ACM with the 10-year best paper award, for the publishing of the article of the Middleware'2000 of larger impact in the academy and in the industry in the last 10 years; (4) the award of the doctor Karina Delgado (graduated through our program) in the Theses and Dissertations in Artificial Intelligence Contest (CTTDIA 2010); (5) the award of doctor Marcio Moretto Ribeiro with the first place in the category Doctor Theses in the contest of the SBC in 2011; (6) the award of the master Glauber de Bona in the Theses and Dissertations in Artificial Intelligence Contest (CTDIA) 2012, and of the doctor Márcio Moretto Ribeiro, second place in the CTDIA 2012; and (7) the award in second place of the master Ary Fagundes Bressane Neto in the contest of master dissertations of the CLEI in 2011.

With respect to the MAE we highlight Professor Florência Leonardi who was awarded with the Award for Women in Science given L'Oreal - Academy of Sciences - UNESCO, in 2013. In 2011, the doctorate theses of the student Arthur Lemonte, oriented by professor Silvia Ferrari, received an honorable mention in the CAPES Theses Award. In 2014 the master dissertation of the student Elizabeth Gonzales Patiño won third place in the masters dissertation contest of the SINAPE.

2.8.1.6 Comment on the national and international impact of scientific and technological knowledge generated by theses and dissertations.

R: Most of the students graduated by the post-graduation programs of the Institute are docents in Brazilian universities in different states of the federation. There are egresses that act as docents in Latin-American universities, United States and European Community. They keep developing research activities, many times in collaboration with docents from the departments. Considering the the basic research activity developed in Brazil is essentially performed by the Brazilian public universities, the impact of those egresses is huge for the formation of new researchers in Brazil and South America. Consequently attracting many foreign students, mainly from South America and Africa. Besides, the results of the theses and dissertations generate scientific articles published in important international journals. Such works have been presented in many international congresses of the field, many times with the financial



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support of the Program.

2.8.1.7 Comment on the impact of the involvement of the School's students and professors within the Graduate Program in scholarly exchanges.

R: The Post-Graduation docents of IME participate of scientific meetings in Brazil and abroad, bringing important contributions, such as new agreements with centers and universities from United States, Spain, France, Italy, which have allowed the mobility of our docents and alumni. On the other hand, the students that performed research internships in other centers end up bringing new ideas and new problems. Also we have docents of the programs that offer in a systematic way, disciplines and courses in other universities and institutes, as for instance, Federal Technological University of Paraná (UTFPR), FioCruz, University of California - Irvine, as also in other post-graduation of USP itself like in the inter-universities programs in Biotechnology and Bioinformatics.

2.8.2.1 Describe the policy governing how scholarships are distributed from the School's Programa de Aperfeiçoamento de Ensino (PAE) [Teaching Training Program].

R: We understand in the program that the formation of post-graduation students becomes complete with a docency internship towards some of the undergraduate disciplines. In the program PAE, the activities are supervised directly by one of the docents of the Departments, often the mentor of the student. By means of the PAE, many post-graduation students have the opportunity to lecture undergraduate classes, design tasks and exercises, participate of the correction of tasks, offer exercise classes, doubttaking shifts, among other things. This internship is mandatory do the scholarship fellow students from CAPES, but open to the other students at IME. The subscriptions and the concession of scholarships are judged accordingly to the following criteria: 1. academic performance of the candidate; 2. analysis of the Project of Activities of the PAE Internship; 3. adjustment of the formation of the candidate to the program of the undergraduate discipline of which will be developed the Internship Stage; 4. number of times the student has participated of the Supervised Internship Stage, as well as their performance; 5. In case of a draw in the other criteria, the Capes scholarship fellows will be prioritized.

2.8.2.2 What is the relationship between demand for and availability of scholarships from the School's Teaching Improvement Program?

R: Until the first semester of 2014, practically all the scholarship requests for PAE were attended. In the second semester of 2014 82% of the requests were attended.

2.8.2.3 Report dropout rates of the School's Graduate students in the last 5 years. Are there policies to avoid dropout in these Programs? Comment

R: There was an increase in the evasion rate of all the Post-Graduation Programs of IME, in average, 32%, except in the Program of Statistics, which rate was of 7,2% in the doctorate and 15,6% in the master. We believe that the high rate of evasion is given by the elevated cost of life in the city of São Paulo and the small quantity of available scholarships, compared to the number of students.

2.8.2.4 List the support services provided by the School to Graduate students (not considering those provided by the Central Administration).

R: Besides the infrastructure provided by IME (librar, study place, various laboratories with computational equipments), the groups of research of the Department have provided support to the students.



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Equipments obtained through projects of research have been put available to the students and aids for participation in congresses have been conceded in the same way. The Post-Graduation Committee has also supported the participation of students in congresses, either in Brazil or abroad, through the funding CAPES/PROEX/PROAP.

IME-USP has an audiovisual section with equipments like laptops and projectors, which have been very much used in the undergraduate post-graduation disciplines and offered by the Institute. The Institute has a restricted room for access only of post-graduation students and docents that has currently 24 computers. IME's network is strongly based in free software, but also has commercialized software that are important to research, such as Maple, Mathematica and Matlab. Besides that, many laboratories of research put equipments of the same level available to the participating students, which have servers dedicated to their projects. Undergraduate students use a different network, with over a 150 access points. The library of IME-USP is one of the most complete in the field of Mathematics in Latin America. Its collection, specialized in Mathematics, Statistics and Computation, gathers 67.166 works (dictionaries, dissertations and theses, e-books, encyclopedias, booklets, books, technical reports) and access to 1.429 journals (including those with electronic access, besides those with subscription amounting to 141.745 issues). Every year a great effort is made in order to keep the collection updated through the acquisition of new titles or new editions of renowned titles, and the constant expansion of access to journals. Since 2006 all the collection have free access to any person interested. This way, all the users of the library have direct access to the volumes and to the data bank with the information about the bibliographic collections.

2.8.2.5 What is the profile of Graduate Alumni expected by the School?

R: Our post-graduation aim to form masters and doctors with solid academic formation, who become leaders in different layers of society, either in the work market (companies) or in the academic environment (institutions of research and Brazilian universities or abroad). The Bioinformatics program aims to graduate masters and doctors that, besides the specific knowledge in the field of computation, have complementary formation in some field of biological research, being able to act interdisciplinary in an effective way. All the egresses from the program are currently working, most of them in federal public institutions or from the State of São Paulo.

From the Professional Master is expected that the egresses have the autonomy to create new didactic methods in order to evaluate didactic projects and work on the formation of professionals in the field of education.

2.8.2.6 Are the subjects and teaching and learning processes implemented in the Graduate courses within the School consistent with this profile? Comment.

R: Yes. The post-graduation program gives special attention in making available different disciplines that may fulfill the diverse interests of their alumni. There is a concern of the Post-Graduation Programs with the average time of graduation to follow the standards of the main foment agencies. The Programs have a wide syllabi with general and specific disciplines that cover fields related to the lines of research developed by the docents of the Institute. Students have also an intense program of conferences and seminars organized by the groups of research of the Institute. We should mention that the program encourages and gives financial aid for the students to participate of scientific events of excellence in Brazil or abroad.

The syllabi of the courses in its totality, and with constant monitoring in order to reach its update, aim the academic formation of the alumni with cutting-edge knowledge, so that the latter are able to become good professionals. Our post-graduation aim to form masters and doctors with solid academic formation who become leaders in the different layers of the society, either in the work market (companies) or the academic environment (institutions of research and universities).

2.8.2.7 Does the School have any formal relationship with Graduate alumni? Is there any



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system within the School to track these alumni?

R: The Institute have kept constant interaction with a large numbers of former graduate students of program. Example: students, especially of Doctoral, have maintained partnership of research with our docents. They also participated in judging commission exams and often visiting Institute.

2.8.2.8 Comment on the fields and areas of professional practice of the School's Graduate alumni (both in the academic and non-academic fields).

R: The most of PhDs students trained by our program are docents in brazilian universities in differents states of the federation and foreign universities, and keep developing research activities, several times in collaboration with docents of this Institute. A considerable number of students are teaching in Latin American universities, as, for example, Pontificia Universidad Catolica de Chile, Pontifica Universidad Catolica de Peru, Universidad de Valparaiso, Universidad de Santiago, Universidad Nacional del Mar del Plata, e Universidad de Buenos Aires, among others. With respect to the master graduates who do not follow the PhD degree students, some of them work in the area of education , however, most have actuated professionally in private companies, financial institutions, research institutes, insurance companies and the industries have absorbed most of the Master gduates. It is expected that the Professional Master graduates in schools, textbook publishers, production of textbooks and materials, performance in public agencies focused on education, among other activities. Computer Area graduates have had two basic destinations: In the industry, they have been designed to start-ups (Caelum, Playax, etc.) and for large companies in the area of software, such as IBM, Accenture, Intel, etc. At the academy, our students have found positions in several of the country computer science departments in universities such as USP-SP, USP-São Carlos, Unicamp, UFABC, UFPR, UFSC, etc. In Bioinformatics of 38 doctors trained since the program's inception in 2002, thirteen graduates are part of the faculty of Brazilian public universities (7 from the University of São Paulo); three hold positions in the Foreign universities (San Augustin in Peru, Queensland Australia, Princeton in the USA), 7 occupy the position of researcher in national institutions (LNCC, Ludwig Institute, EMBRAPA and LNBio, Brain Institute, AC Camargo Hospital) and exterior (Vandique Institute, Chile), 4 the private sector (IBM, Aché, Illumina).

2.8.2.9 Mention outstanding performances of the School's Graduate alumni.

R: Many of former students of graduate of our program are docents at universities and occupy position as heads of departments, heads of graduate and president of scientific societies programs, and act as committee members of funding agencies like FAPESP, CAPES and CNPq. For example, from the Bioinformatics Program: Daniel Takahashi is researcher at Princeton; Vinicius Maracajá Coutinho is Researche Director of Institute Vandique (Chile); Alexandre Cristino is Research Fellow at Queensland Brain Institute (Australia); and Ricardo Vêncio makes part of the coordinator of Program.

2.8.3.1 Is qualification to work in the Graduate Program taken into account when hiring new faculty members? Comment.

R: Certainly, the candidate's ability to act in the Postgraduate is a major measure quality in hiring new teachers. So, the teachers hired in recent years our Institute are young noticeable researchers and have contributed much to te teaching graduate courses, guiding students,etc,and some of them are part of Coordinating Commitees of the Institute Graduate Programs.

2.8.3.2 Indicate initiatives intended to strengthen the internationalization of the School's



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Graduate Programs.

R: The internationalization of the Institute's Graduate Program has been given in several ways. They have historically received a large amount foreign students, especially Latin Americans and Africans. In addition, the growing Brazilian funding opportunities and USP, such as collaborative projects of the Science without Borders, USP-Cofecub, Math AMD Sud, Thematics etc., have attracted postdocs and foreign researchers for Unity. The clearest initiative to strengthen graduate of internationalization is the establishment of various international covenants of our academic programs with institutions from many countries such as: Chile, Denmark, Finland, France, Mexico, Portugal. In order to maintain and improve internationalization, the Institute has a policy to support the scientific exchange with peers from other universities in Brazil and abroad, and rules for long and short clearances, which allow active researchers, especially those working in post-graduate, maintain a constant contact with academic research groups in Brazil and worldwide. The IME also has managed to provide good working conditions for visiting docents and postdoctoral trainees, despite the space problems of departments, so that the number of these visitors and trainees, particularly foreigners, has increased considerably.

2.8.3.3 Indicate the School's projects and Programs collaborating with each other and/or with other Schools within USP and also with other public and private institutions.

R: The Professional Master has accredited six teachers from other EMI depto.do. The Prog. Mathematics has students with co-supervisors from other institutions: John Guaschi-Université de Caen (France), Manuel Gonzalez-Universidad de Cantabria (Spain), Patrick Le Meur-Institut Mathématiques de Jussieu / 7 Paris (France), Sibylle Schroll- University of Leicester (UK) and external teachers: Gabriel Haeser (MAP), Jorge Manuel Tello Sotomayor (MAP), Marcone Correa Pereira (MAP, Salvador Addas Zanata (MAP), Carlos Eduardo Duran Fernandez (UFPR), Edson Ribeiro Alvares (UFPR), Fabiano Gustavo Braga Brito (UFABC), Maria de Lourdes Merlini Giuliani (UFABC), Rodrigo Lucas Rodrigues (UFC), Rosana Retsos Signorelli Vargas (EACH-USP), Umberto Leone Hryniewicz (UFRJ). Docents from this programs have given especially support to the consolidation of other programs, as ProCad funded by Capes and its support of scientific development of UFV and of UFMG and the Procad-NF-2009, with collaboration of UFPA. Through of notices of furtherance agencies of federal government, the funding lines of Fapesp and the notices of Pro-rectors of USP, this program has countless projects in collaboration with other institutions/faculties USP and with other Brazilian and foreign public institutions. The "interunits" in Bioinformatics is of the colaboration with other institutions of USP. The Statistical Program has a CEPID FAPESP project in Neuromatematica, coordinated by prof. Antonio Galves, which has members of several national and international institutions. Many docents in the statistical department are engaged in two importants projects FAPESP Thematic: 12/21788-2 Regression Models and Applications, coordinated by prof. Heleno Bolfarine, and 09/52379-8 Stochastic Modeling Interagency Systems, coordinated by Prof. Luiz Renato Fontes. Both projects has including members from others institutions. The thematic project Fapesp 2013/00506-1, coordinated by Prof. Pedro Alberto Morettin is formed by researchers at IME, IMECC-UNICAMP and FEARP-USP. Docents of the Department are members of following interdisciplinary projects: Center Support of Complex Fluids Research at Institute of Physics/USP; Center of Convergence to Life Sciences, Physics and Engineering for Innovation in Diagnostics and Therapy, NAP Dean of Research/USP; Center of Research and Public Policy NUPPS, Research Group of Indutive Statistics based in UFSCar; using the modern autopsy techniques in research of human diseases (MODAU), FAPESP Thematic 2013/21728-2. Neuronal Circuits Research and Biological Markers Involved in Obsessive-Compulsive Disorder through Behavioral Paradigms of Fear and Anxiety, FAPESP Thematic 2011 / 21357-9 and probabilistic modeling of brain activity funded by CNPq. The docents programmes applied mathemtics have several projects of major national funding agencies, in partnership with professors from various institutes such as: CEPETEC, Petrobras, IPEN, Medicine, Public Health and Secr.da Inst. Butantã.

2.8.3.4 Are the School's Graduate Programs prepared to receive international students? What



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are the initiatives and difficulties faced?

R: It has been a constantly practical of Institute receive students and docents from different Institutes of foreign research. Recently agreements still in force of academic cooperation for the co-orientation of graduate students including double degree has been signed. We can quote the Université Du Sud Toulon-Var and the Université de Provence (Aix-Marseille I), both in France. The programs have a high percentage of foreign students, coming mainly from Latin American, but also from Europe and Africa. Students of programs has organized each semester a reception for the incoming students, where is possible enlighten their doubts about the Program and on the bureaucratic requirements for installation in the country. One difficulty we have is lack of staff in post-graduate departments and in others departments who are able to speak english and spanish fluently. Some programs has offer entrance exam in several countries abroad, including Peru, Colombia, Argentina, Cuba, Egypt and Brazil.

2.8.3.5 Does the School promote actions to encourage students to participate in supervised training programs in Brazil and abroad?

R: Graduate program students have received funding (some source of PROAP / PROEX - CAPES, CNPq and FAPESP) to attend events abroad. In addition, a significant number of doctoral students has done internship "sandwich" in foreign institutions, with the full support of the graduate programs of the Institute.

2.8.3.6 Is there an incentive policy encouraging entrepreneurship in the School's Programs?
Comment.

R: In a general context, our students are encouraged to become multipliers of knowledge and trainers of other professionals in their respective areas. This Institute has as an example, the Competence Centre for Free Software (CCSL) - ccsl.ime.usp.br and the Center for Research Support in Free Software (NAPSol) the pro-rector of research, which have played an important role in fostering the creation of startups originating from research projects developed by students graduate from our programs.

Research

2.9.1.1 Outline the profile of the School's research activities, describing the main fields, groups and lines of research.

R: In the Institute, there is theoretical research in: mathematics, statistics, and computer sciences. There is also applied research in the same areas plus mathematical education. The research in pure and applied mathematics is concentrated in both departments MAT and MAP; the research in statistics and probability is concentrated in MAE, the research in computer sciences is concentrated in MAC, and the research in mathematical education in both departments MAT and MAE.

The research activities in mathematics focus in the following areas: (1) algebra, (2) mathematical analysis, (3) geometry and topology, and (4) logic and foundations. The main areas of research in applied mathematics are: (1) Dynamical Systems, (2) Ordinary Differential Equations, (3) Partial Differential Equations, (4) Mathematical Physics, (5) Numerical Analysis, and (6) Optimization. The main research areas in Statistics and Probability are: (1) Survival Analysis, (2) Improvement of Asymptotic Methods, (3) Atuary Econometrics and Finance, (4) Bioinformatics, (5) Fundaments in Probability and Statistics, (6) Bayesian Inference,



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(7) Inference in Stochastic Processes, (8) Modelling of Interacting Complex Systems, (9) Models of Regression and Applications, (10) Generalized Linear Models, (11) Time Series, and (12) Reliability Theory. The main research areas in Computer Sciences are:
(1) Databases; (2) Bioinformatics; (3) Combinatorics and Discrete Optimization; (4) Computer Music; (5) Encryption and Data Security;
(6) Parallel Computing; (7) Artificial Intelligence and Logics; (8) Middleware and Systems; (9) Continuous Optimization, (10) Stochastic decisions and Decentralized Control; (10) Image Processing and Artificial Vision; (11) Theory of Computation, (12) Complexity, and
(13) Formal Languages.

The many research groups in, for instance, Algebra, Mathematical Analysis, Geometry, Topology, and Probability, can be found in the attached reports by the departments of the Institute.

2.9.1.2 Highlight from three to five research activities that best represent your School. Comment on the relative impact of three to five main research products (e.g. manuscripts, patents, and public policies) from the School in the period.

R: The main research activity of the Institute is the obtainment of original results in mathematics, statistics, computer sciences and their applications and its consequent publication in periodicals with international circulation and selective editorial policy.
Other research activities are: organization of regular seminars and events and academic exchange with the main mathematical centers in the world. The faculty is highly qualified. There are approximately 65 faculty members (including some who are retired) with a prestigious CNPq grant and among them 7 are in the highest possible level 1A. Some of the researchers of the Institute gave great contributions to their fields of research. One may mention, for instance, the papers (published in the Journal of the American Mathematical Society (AMS))": "The tame and the wild automorphisms of polynomial rings in three variables" (vol. 17, 2004, p. 197-227) and "Poisson brackets and two-generated subalgebras of rings of polynomials", (vol. 17, 2004, p. 181-196), written by Ivan Shestakov (IME-USP) and Ualbai Umirbaev. For these papers, the authors received the "E. H. Moore Research Article Prize" in 2007, a prize awarded every three years by the AMS for an outstanding research article that appeared in one of the primary AMS research journals. One should also highlight the CEPID-NEUROMAT (<http://neuromat.numec.prp.usp.br/>) coordinated by Prof. Antonio Galves, an ambitious project funded by FAPESP in order to mathematically model brain processes.

2.9.1.3 Describe the development of scientific and technological production in the School in the last 5 years (papers, books, patents, curatorship, and expositions, etc.).

R: Book or chapter of a book: (2010) 21, (2011) 24, (2012) 24, (2013) 24 e (2014) 20.
Number of research articles by nonretired scholar: (2010) 1.3, (2011) 1.2, (2012) 1.5, (2013) 1.4 e (2014) 2.2.
Data obtained from "Lattes-CNPq" by means of the code Tycho from "sistemas USP".

2.9.1.4 What are the indicators used by the School to assess the relevance of scientific and technological production (number of citations received in ISI, SCImago, Scopus, impact of periodicals and others, deposited and licensed patents)? Describe the development of the main



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indicators in this period.

R: An article is roughly evaluated by the number of citations (Scopus, Web of Science and Google Scholar) and the prestige of the journal where it was published. The Institute has used Scopus, Web of Science and Google Scholar. This information can be obtained through "datausp" from "sistemas USP", quotes functionality. The citations are given separately for each scholar and for this reason the integrated citation number for the whole Institute is not given here (see the MAC report for the integrated citation number of the Department). In all more rigorous evaluation of the scholar, his scientific work is submitted to a committee.

2.9.1.5 Describe the development of scientific papers published in the period by the School with the collaboration of International Universities. What is the percentage of these papers in relation to the total number published by the School?

R: The percentage of papers published by the IME scholars in collaboration with researchers from foreign universities varies with the department. There is a time fluctuation with no increasing or decreasing trend. For instance, in 2014 this percentage was approximately: 60% MAT, 20% MAP, 25% MAC, and 16% MAE. There are many non-brazilian scholars in IME and this number is increasing rapidly. The percentage of non-retired non-brazilian scholars in IME is: 25% MAT, 10% MAP, 15% MAE, and 5% MAC.

2.9.1.6 What is the School's scientific policy?

R: The Institute scientific policy is to try to give support for all scientific initiatives of the departments, the research groups, and the researchers. The Institute in accordance with the departments: encourage scholars to realize short a long research visits to foreign institutions; encourage scientific exchange programs with research centers in Brazil and abroad; and give secretarial support toward organization of seminars, conferences, meetings, etc.

2.9.2.1 Comment on the School's participation in research networks and academic projects (CEPIDs, INCTs, Thematic Research Groups, Pronex, and CNPq's Integrated Projects, PADCT's Projects, FINEP, etc.) and the School's interaction with public and private sectors.

R: The Institute has had several "projetos temáticos FAPESP" for the last 5 years (more than 10 had a professor from the Institute as the leader), the same being true for other types of projects and grants from FAPESP, CNPq, e CAPES. There are also "NAP's" (see <https://www.ime.usp.br/dcc/naps>) supported by USP. Projects with the private are concentrated in MAC (see http://www.vision.ime.usp.br/creativision/publications_dcc/Pj-0.html). Here, it must be emphasized the project CEPID-FAPESP NEUROMAT-"Research, Innovation and Dissemination Center for Neuromathematics", led by Prof. Antônio Galves (see <http://neuromat.numec.prp.usp.br/>).

2.9.2.2 Provide information on the Centers linked to the School. What is their contribution to the School's academic development?

R: There are three research groups supported by USP (NAP) led by IME scholars: NUMEC-MaCLinC (MAE), NAWEB (MAC), and ESCIENCE (MAC) (see <http://www.ime.usp.br/dcc/naps>). Moreover, through MAC, the Institute also participates in another NAP of "Free Software". Again, it must be emphasized the project CEPID-FAPESP NEUROMAT-"Research, Innovation and Dissemination



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Center for Neuromathematics", led by Prof. Antônio Galves from MAE (see <http://neuromat.numec.prp.usp.br/>). Besides all the research activities of these centers they contribute to raising funds for the IME. For instance, the overhead of the CEPID for the Institute is approximately two million reais.

2.9.2.3 What is the School's fundraising policy? What are the indicators to measure success?

R: There is no formal policy for fund raising. The Institute can raise resources for infrastructure and computational support, besides funding for scientific activities, through the individual projects of research and of groups of research. The success is measured by the number of scientific projects and their respective sizes.

2.9.2.4 What is the School's policy regarding support of core activities (publishing books or chapters, papers, patents, other research publications and the creation of public policies)?

R: The Institute has supported the research, and consequently the writing of papers and books, by means of a very generous academic policy of leave of absence. The Institute has updated its computational and library facilities which helps both research and teaching activities. The Institute is responsible for the "São Paulo Journal of Mathematical Sciences" and edits a book series.

2.9.2.5 Provide information on the number and describe the development of post-doctoral and young researchers supported by funding agencies in the period? Comment on the development in regard to the previous period.

R: The number of brazilians and non-brazilians post-doctoral fellows in the Institute has increased in the last few years. The number of new post-docs at IME in each year are:
21 (2010), 27 (2011), 20 (2012), 28 (2013), 27 (2014) e 18 (2015). Nowadays there are 51 active post-docs.

2.9.2.6 Analyze the School's post-doctoral activities, or the perspective on implementing it, as well as the impact of post-doctoral scientific publications.

R: The post-doctoral fellows work exclusively on research. When the post-doc has a scholarship, it is provided by state agencies. The applications are prepared by the candidates and their supervisors. The Institute only provides infrastructure support.

2.9.2.7 In addition to research activities, does the School have policies to include post-doctoral and young researchers in Undergraduate and Graduate teaching activities? Comment on the impact of these activities in the post-doctoral scientific publications.

R: Only occasionally the post-docs participate in graduate courses. There is no initiative to involve post-docs and young reserachers in teaching activities.

2.9.2.8 Indicate the main scientific meetings organized by the School.



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R: Ninety nine scientific meetings were organized by IME scholars (MAC 58, MAP 7, MAE 18, and MAT 16) from 2010 to 2014. Many of the meetings organized by the MAC scholars were of a local character (see http://www.vision.ime.usp.br/creativision/publications_dcc/Eo-0.html), this explain the very different figure from the other departments. There were many important international thematic meetings (in algebra, geometry, analysis, probability, and in several branches of statistics, applied mathematics, and computer sciences). See the reports of the departments for details. Among all meetings it is worth mentioning the: "I Brazilian Congress of Pure and Applied Young Mathematicians" (see <http://jovens.ime.usp.br/jovens/pt-br/Sobre>). This meeting was held in December 2014 at IME and was attended by more than 250 young mathematicians (less than 40 years old). There were 16 different thematic sections among all areas of pure and applied mathematics and the young Artur Ávila, one of the Fields-medal winner in 2014, participated in this meeting.

2.9.2.9 Is there any initiative to improve and expand the School's Scientific Training for Undergraduate Students.

R: In recent years, an effort has been made in order to improve the students' participation in undergraduate research projects ("IC"). It was created a biannual event, the Undergraduate Research Symposium (Simpósio de Iniciação Científica), in which every student participating in some project is invited to give an oral presentation or presenting a poster of their work. A resume of each work presented in the symposium is published in a special volume with the conference proceedings, which makes the participation more attractive to both students and supervisors. In the undergraduate courses that have a final project the IC can be used for this purpose.

This is also an attractive for some students. A student can do an IC with or without a scholarship.

According to the University "annual statics book" the IC-scholarship figures at IME are:

2010, 15 scholarships: 9 CNPq, 3 FAPESP, 3 other sources;
2011, 14 scholarships: 5 CNPq, 5 FAPESP, 4 other sources;
2012, 18 scholarships: 3 CNPq, 5 FAPESP, 10 other sources;
2013, 32 scholarships: 10 CNPq, 9 FAPESP, 13 other sources;

Culture and extension

2.10.1.1 What is the School's Culture and Extension policy?

R: The Institute does not have a formal status regarding the activities of Culture and Extramural, but it is possible to say that it has consolidating, throughout the years, a homogeneous way to deal with subjects of this nature. The Culture and Extramural initiatives come from the docents that count with the support that the Institute can give whenever needed. By the time they grow and stabilize, their institutionalization becomes natural. This way, IME/USP has created many Centers that regularly aim at the activities of Culture and Extramural.

Therefore, the Committee for Culture and Extramural of IME/USP (CCEX) has taken the role of supporter for political issues and means so that the Centers and other individual actions may reach their purposes, instead of the Committee itself be the advocate of such actions.

It is expected, however, that, each time more, the CCEX become the proponent of the actions, or that it embraces the actions idealized by the docents from the beginning. This new policy must be tested in the next quinquennium inside the possibilities with the current distribution of human resources of the Institute.

2.10.1.2 Describe the main activities of the School's Culture and Extension programs and



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projects and how these have developed in the last 5 years.

R: Many of the actions mentioned below were already being developed in the period previous to 2010, however, they're being consolidated each day more.

Interdepartmental:

The many courses of diffusion of the Summer Program, which occur annually in the months of January and February;

The Summer Course of Bioinformatics, which occurs annually, for a week, at IME/USP;

The expositions at Matemateca, collection of interactive objects conceived to foment the taste for Mathematics, and its officialization as the Center of Diffusion and Teaching Matemateca;

The participations of IME in the programs of the Pro-Rector of Culture and Extramural: Monitored Visits, Profession Fairs, scholarship from the Learn with Culture and Extramural, projects of the Foment for Culture and Extramural;

The editing of 2 important journals of the Brazilian Society of Mathematics, of the Professor of Mathematics and the College Mathematics Journal.

MAT

The courses of Update promoted by the CAEM, for professors of primary and secondary school, preferably of public schools, with accreditation from the competent bodies linked to the Secretary of Education.

The courses of Professionalization practice realized simultaneously with the discipline MAT1500 of the Licensure;

The workshop programs of the CAEM, which occur along the school semesters, focused on teachers from the primary and secondary schools and licensed teachers;

The Project of Support for the Improvement of the Teaching of Mathematics in Public Schools, created as an activity of the Local Coordination of the OBMEP and coordinated by CAEM since 2012.

MAE

The course of Improvement of the Department of Statistics, which makes use of the undergraduate disciplines to improve the formation of egresses from other undergraduate courses, preparing them for the masters or the work market;

The advisories and consultancies of the CEA.

DCC(MAC)

The inauguration of the building of the CCSL and its increasing number of activities and projects, in particular its positioning about issues regarding the I.P. of software towards the public bodies and the National Congress;

The important participation of IME in the organization of parts of the Brazilian Olympics of Informatics and of the Programming Marathon, events of yearly periodicity that attract 100s of students;

The courses focused on teachers of the primary and secondary school of the Laboratory of Teaching of Mathematics, which goal is to develop and to diffuse methodologies for teaching of Mathematics using the computer.

Adm

The organization of the communication advisory of IME of the webpage and the social networks, as well as the establishment of an internal newspaper, the "Acontece no IME "

The release of 5 titles by the Editorial Committee of IME, in partnership w/ the publisher Livraria da Física.

CEPID

The start of the activities of diffusion CEPID "Neuromat"(funded by FAPESP) w/the creation and availability of a free software to acquire and organization of neurological data

2.10.1.3 Does the School use indicators to assess the Culture and Extension activities?

R: No. The Institute makes little use of indicators, in favor of a qualitative and global vision of the merit of the activities. This is not different from research itself, in which little use of indicators is made in order to direct internal actions (as it is done in other places, for instance, for the distribution of the the teaching workload).



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In the case of activities of Culture and Extramural, the question of indicator is yet more complex, because of the huge amount of possible actions of this kind and the absence of universally consolidated measures, independently of its adequation. This debate is at course in the Council of Culture and Extramural (CoCEX) and should direct the gathering of data and information inside IME in the next years.

2.10.1.4 Indicate the impact of the Culture and Extension activities performed within the School in terms of effective or potential benefits.

R: The activities of Culture and Extramural at IME have qualitative impact, because most of them serve as example for another similar initiatives. The actions toward the teaching of mathematics in the public school are important, the actions of dissemination of mathematics (expositions and fairs), the actions of educational entertainment (realization of olympic games and the training for it), the wide range of courses, which is a highlight at the University of Sao Paulo, the services of statistical advisory, and the diverse actions in the field of free software.

2.10.1.5 Does the School have a policy designed to encourage valuing culture and extension activities in considering the faculty's activities? Comment.

R: Formally there is no such appreciation, because there is no such systematization for activities of teaching and research.

Recently, because of the requests of horizontal promotion in the career, there was an impression that the activities of Culture and Extramural, by themselves, were not able to justify the promotion. However, the judgement of the requests were not directed by a policy made in the Institute, therefore, any conclusion taken from this process may not be attributed to an institutional activity.

2.10.2.1 Report the main professional training and continuous education activities, the number of issues and participants (report amounts in the context of fundraising):

a) Specialization Courses

R: We don't have specialization courses.

b) Training Courses

R: The improvement in Topics of Statistics, which has a duration of 2 years, have as goal to complete the formation of graduated professionals, docents or not, as well as to aid those who go to post-graduation. The program have also received teachers of Mathematics of the high school that aim to improve their knowledge on Statistics for the teaching in the high school. The students take modules of disciplines, totaling 180 hours, selected from the syllabi of the undergraduate courses offered by the Department of Statistics and, at the end of the program, the student has the right to a certificate.

c) Updating Courses

R: in the period, the courses of the modality "Update" were organized by CAEM and lectured either by docents from IME or educators from CAEM. The courses were:

"Functions and Modelling

For teachers in the secondary and high school of the public school.

It had 3 editions: 08/21/2010 to 11/12/2010, with 38 subscriptions; 03/19/2011 to 06/18/2011, with 50



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subscriptions; 04/13/2012 to 07/13/2012, with 30 subscriptions.

This course was recognized by CENP (Coordination of Pedagogical Studies and Norms). The 2012 edition was made for teacher linked to the Directory of Teaching - South Zone of Guarulhos, with recognition from the CGEB (Coordination of Management of the Basic Education) of the Secretary of Education of the State SEE- SP.

"Number: why and what for?"

Courses of blended learning mode, offered from 09/24/2011 to 11/05/2011, with 56 subscriptions. It was recognized by CENP.

"An approach of geometry for the initial grades"

Two editions: 09/03/2012 to 11/26/2012, with 12 subscriptions; 03/23/2013 to 06/29/2013, with 36 subscriptions. Course focused on teachers of the primary school, preferably from the public school.

Recognized by EFAP (School of Formation and Improvement of Teachers, of the Secretary of Education of the State).

"Topics of Mathematics for Teachers"

In the week of January 21 to 24, 2013, CAEM has promoted the 2nd edition of the Summer at CAEM. Four workshops for teachers of mathematics in primary and secondary school were offered. The event was free of charges and integrated the 5th USP-School Encounter. Of the 42 participants, 33 receive EFAP certificates.

"An approach of arithmetics for the initial grades"

Offered in the period from 09/14/2013 to 11/23/2013, with 37 subscriptions. Focused on teachers of the primary school, preferably from public school. Recognized by EFAP.

"Transition from primary to secondary school - the role of the mathematics teacher"

Offered in two editions: 06/15/2014 to 05/31/2014, with 36 subscriptions; 09/13/2014 to 11/08/2014, with 30 subscriptions. Focused on the teachers of the first year of secondary school. It was recognized by EFAP.

"An approach of the algebraic thought for the initial grades" (03/15/2014 to 05/31/2014, 28 subscriptions) and "Activities for the development of logical reasoning for the initial grades" (09/08/2014 to 11/29/2014, 33 subscriptions), focused on the primary school and recognized by EFAP.

d) Residence Activity

R: Does not apply to the Institute.

e) Vocational Practice

R: "Projects of Internships: Learning Mathematics with Projects"

4 editions: 03/09/2010 to 12/11/2010, with 28 subscriptions; 03/15/2011 to 11/30/2011, with 25 subscriptions; 03/12/2012 to 11/27/2012, with 33 subscriptions; 03/19/2013 to 11/29/2013, with 16 subscriptions.

"Projects of Internships: Learning Mathematics with Projects - Level II"

2 editions: 03/18/2011 to 11/30/2011, with 6 subscriptions; 03/13/2012 to 11/27/2012, with 5 subscriptions.

These disciplines promote an association between the formations, initial of the licensed from IME and continued of the teachers of primary and secondary school, in the context of the new program of supervised curricular internship for Licensure in Mathematics of IME. The approximation between teachers and licensed is essential to the strengthening of the formation of both parts and, therefore, the improvement of the teaching in the State. In this practice, licensees and teachers elaborate projects or didactic sequences and apply them in the classroom. The licensee are linked to an undergraduate discipline (MAT1500).

"Topics of Mathematics for Teachers 2014"

In the week of January 20 to 24, 2014, CAEM promoted the 3rd edition of the Summer in CAEM, which has made possible for teachers of the primary and secondary school, returning from vacation, to



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participate of the 6 workshops offered during the event. The Summer in CAEM 2014 was totally full of charges and integrated the 7th Encounter USP-School, receiving financial aid from the CAPES Program New Talents. All 30 participants received certificates from PRCEU-USP and EFAP.

2.10.2.2 What is the importance of and what are the consequences/impact of the School's participation in advising, consulting, and the delivery of specialized services to public and private institutions, scientific entities and other organizations in society? List the agreements and contracts managed by the School in recent years (with scope, timing and amount).

R: The Centers CAEM, CCSL and CEA are the instalments from which IME attends faster the demands of the society. CAEM, to what concerns the issues of basic teaching, the CCSL in the issues of Free Software and CEA in the issues of Statistics.

The CEA has often aided researchers of USP in the statistical analysis of their master and doctorate theses having a direct impact in the quality of the produced articles. The aid provided goes from orientation in the planning, the scaling of sample and the organization of data banks up to the complete statistical analysis. Other researchers seek CEA to obtain advisory in works that are published in the most important journals in the fields of medicine, odontology, psychology, etc., with international circulation. Researchers from public bodies have used the services of advisory of the CEA for the development of diverse methodologies.

CCSL holds diverse projects that may be seen in its webpage.

Hundreds of teachers attend the CAEM facilities seeking advisory along the educators. CAEM also offers to the public: consultancy and advisory to the school community regarding specific contents of Mathematics and teaching methodologies; and lend didactic material for registered users.

List of formal agreements realized with IME related to the activities of Culture and Extramural:

"Technology of Visualization in Safety and Defense 0 RBV" (Finep, PUC-RS, USP, IME-USP, UNISINO), 08/27/2008 to 08/28/2011, R\$221.119,84.

"Morfeo: Research and Development of Technologies and Models of Open Innovation Based on Free Software", 3 years from 2008 on, Telefonica, R\$ 60.000,00.

"Laboratory of Interoperability", Microsoft, 10/20/2009 to 10/20/2010, R\$50.000,00.

"Enabling Scalable Cloud Services Choreography-"BAILE'", Study of problems related to the development and use of choreographies in environments of large scale, HP, 08/02/2010 to 12/31/2010, 01/03/2011 to 12/31/2011 and 06/01/2012 to 12/31/2012, R\$106.076,88, R\$229.526,37 and R\$174.146,31.

"Program São Paulo Network of Docent Formation" - Courses of formation of teachers, 04/24/2010 to 06/30/2013 Secretary of Education of the State of SP, R\$43.891.208,60.

"Virtual University of the State of São Paulo-UNIVESP"- Conjunct act with the Secretary of Higher Education and of USP, aiming to provide the realization of the Course of Licensure in Sciences, 03/23/2010 to 03/22/2015, Secretary of Higher Education, R\$38.459.874,00.

"Virtual University of the State of São Paulo-UNIVESP"-Realization of the Course in Specialization in Ethics, Value and Health in School, 03/23/2010 to 03/22/2015, Secretary of Higher Education, R\$1.580.802,00.

"Generating Operational Level Decision for PSP-Gold"-Study and obtain solutions for some variants of problems of job shop scheduling that occur in PrintShop Providers in the area of printing of HP, 02/28/2010 to 12/31/2011 and 01/03/2011 to 12/31/2011, HP, R\$128.435,04 and R\$401.313,21.

2.10.2.3 What is the production of the School's faculty in regard to educational activities and dissemination of scientific, artistic, cultural, technical or technological knowledge, reporting the number of issues and participants:

a) Outreach Courses (e.g. workshops, lectures, etc.)



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R: Practically every Course of Diffusion from IME are given during the Summer. These courses reach different publics: students of public high school in general, undergraduate students from IME and outside, candidates to post-graduation. List summary of the period("n/m"=n classes or editions and m students in total):

Special Program of Dynamical Systems, in the Summer of 2012-12 courses that were also created as post-graduation courses, for the subscription of graduated students.

The Bioinformatics Interunits Doctorate, based on IME, offers annually, in the Summer, a week of Bioinformatics courses. The course has 72 vacancies(36 for Exact sciences and 36 for Biological sciences), 4 class days and a last day with presentations of works and lectures about current research themes.

Free of charges:

Abstract and Concrete Notions of Non-Euclidian geometries,1/33

Applications of Complexes numbers to Analytical Geometry,1/40

Topics of Mathematics,2/28

Analytical Geometry and Diophantine Equations,2/103

Matrix App. and Linear Sstems,1/37

Intro to the Administration of Linux Networks,1/15

Topics of Applied Mathematics and Statistics,1/14

Differential Geometric Calculus in R_n ,2/5

Topics of Linear Algebra,2/12

Numerical Treatment of Differential Equations,1/1

Continued Fractions and App.,1/66

Administration of Linux Networks: An Intro,1/19

With subscription fee:

Linear Algebra,9/693

Algorithms in Java,4/242

Combinatorial Analysis, Probability and App.,5/296

Calculus in R_n ,5/435

Challenges of Programming,2/106

Quality Software Development through Automated Tests,1/35

Usability Engineering for Web Systems,3/78

Metric Spaces,5/160

Analytical Functions,1/32

Fundamentals of Software Testing,1/70

History of Math.,5/267

Web Interfaces w/ HTML, CSS and JavaScript,2/185

Web Interfaces and Data Banks,2/162

Intro to Math. Epidemiology,1/25

Intro to Agile Methods for Software Development,1/21

Intro to programming,10/616

Intro to Probability Calculus,10/764

Intro to the Development of Web Systems w/ PHP,4/94

Intro to the Non-Euclidian Geometries,1/10

Lab. of Teaching of Math.: course about Distance Teaching for teachers of mat.,2/38

Lab. of Extreme Programming,1/13

Lean Startups- An Intro to the Agile Construction of Companies,1/24

LEM: Making of interactive activities in Moodle w/ iTarefa and Igeom,1/22

LEM: Intro to interactive contents for Web course,1/4

LEM: Intro to the use of interactive tools to facilitate the learninga of mathematics,2/18

LE-Geometric Interactive Constructions for High School,2/31

LEM-Laboratory of teaching of Math.,1/15

Basic Linux,5/112

Programming Logic with Java,2/124

Math. and Magic,2/53

Notions of Finances and Financial Market for Students of the Exact Sciences,4/213



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Programming with Java language, 10/955
Solving of Problems and Creativity, 5/274
Program Tests with Java, 1/30
Topics of History of Algebra, 3/72
Topics of Programming, 8/289
An intro to the Exploratory Analysis of Data and Statistic Methods, 5/197
Computer Use in Docent Activity, 1/7

b) Professional Continuing Education

R: We don't have it in the Institute.

c) Projects directed to basic education

R: The projects of IME focused to the primary and secondary school education happen, in its majority, through the activities of CAEM. This is a body with a main goal to promote activities and make projects aiming the improvement of the teaching of mathematics in primary and secondary school. Its target audience is the whole of the teachers in public school. CAEM has, among its activities:

LABEM: Laboratory of Mathematical Education of the CAEM. Those are meetings with groups of teachers about themes that present difficulties in the process of teaching and learning of mathematics.

Lectures: 5 or 6 lectures per year in average.

Workshops: with duration of 3 to 6 hours, happening on Saturdays or week nights.

Those are offered to teachers and also to students of the Licensure. In the last 5 years:

2010: 22 workshops, 479 participants

2011: 28 workshops, 404 participants

2012: 24 workshops, 324 participants

2013: 25 workshops, 341 participants

2014: 27 workshops, 329 participants

Summer at CAEM - a week in January with workshops and lectures. Happened in 2012, 2013 and 2016.

Exposition of CAEM 2013- 25 subscriptions, 17 workshops, 5 lectures.

- Projects of Improvement of the Teaching of Mathematics in Public Schools. This activity, which was created and coordinated by Professor Ana Catarina Hellmeister, local coordinator of OBMEP, has become part of the list of activities of the CAEM from 2012 on. It consists of a qualified training to the students selected to the 2nd phase of the OBMEP and to their teachers, in 6 meetings of 4 hours in Saturdays. In each edition the participation is of 200 to 400 students and 20 teachers, with very satisfactory results not only because of the final classification of these students in the Olympiads, but because of the great impact that the deepened discussion of mathematics brings to students and teachers.

We also have at IME a station of PIC - Program of Undergraduate Research of the OBMEP, since 2014.

This is a program funded by OBMEP that is offered through the course of a year to the medal winners of the OBMEP. It consists of 10 presentational meetings in Saturdays from 8am to 5pm and an online follow-up of the students between two meetings. The students make tasks online and participate of a discussion forum on Mathematics problems. There is didactic material specially designed for the PIC, which the students receive free of charges. The students also receive a grant from CNPq in the value of R\$100 a month during the program. Professor Ana Catarina Hellmeister, retired docent from IME, is the national coordinator of PIC and Professor Cristina Cerri is the coordinator in their station at IME.

d) Exhibitions and fairs

R: IME/USP has a collection of interactive materials for the diffusion of Mathematics that are very popular when exposed. We talk about the Matemateca that, in the turn of the year 2013 to 2014, was officialized as a Center at IME, the Center of Diffusion and Teaching Matemateca. The expositions occur sporadically,



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either in IME as in other places, by invitation. The ones highlighted in the period:

Exposition at IME/USP - São Paulo (may/10)

Exposition at IME/USP - São Paulo (may/11)

Exposition at the II Encouter Hotel of Hilbert (activity of OBMEP) - Nova Friburgo (july/12)

Exposition at the Exploratory Museum of Sciences in UNICAMP - (sep/oct/nov/2012)

Expo at the Center of Scientific and Cultural Diffusion (CDCC) - São Carlos (oct/2013)

Scientific Nightout of USP (oct/11/2014)

Exposition at the building of the Rectory of USP, linked to the II International Research Workshop São Paulo/Lyon - Cidade Universitária, São Paulo - (nov 12 to dec 12 2014)

The latter was the most significant exposition of the Matemateca, counting with its own scenography in noble place. This exposition has inspired the article: "Elegance at Matemateca", by Neldson Marcolin(chief editor). Revista Pesquisa Fapesp, n.226 pp94-95, december 2014.

Matemateca has also been shown at the journal Cálculo - matemática para todos:

"The journey for perfection." by Mariana Osone. Cálculo, issue 43 - year 4 - August 2014 pp.56-65.

Segmento publishing.

"The nature searching for minimuns" by Mariana Osone. Cálculo, issue 49 - year 5 - February 2015 pp.38-41. Segmento publishing.

Besides that, IME/USP participates every year of the program USP and the Professions, organized by the Pro-Rectory of Culture and Extramural. The program has two main actions: the Monitored Visit to the Institutes and the Professions Fair. The Fair happens every year, in the beginning of August, now at the Cientec Park (and before at the CEPEUSP). IME always participates with a stand, in which the undergraduate students make shifts to speak about our courses. The stand is highly frequented due to the small sample of pieces from the Matemateca that are taken to attract the participants of the Fair.

IME also had a very important participation at the first Scientific Nightout of USP, which happened in October 2014. At the day of the event, IME presented and exposition of the Matemateca, a statistics stand, a room with activities of a group for free hardware, a CAEM workshop, a workshop for creation of games, several short lectures and a special one with magic given by Professor Marco Gubitoso. Professor Eduardo Colli, who helped in the central organization of the Nightout, now is a part of the organization of its second edition, to happen in October 2015.

e) Texts, teaching material or other products directed to the community.

R: Journal of the Teacher of Mathematics: Journal of SBM edited at IME by the retired professor Ana Catarina Hellmeister.

Universitary Mathematics: Journal of SBM edited, in a good part of the period, by the professors Eduardo Colli and Severino Toscano Melo.

CAEM Digital

Texts from workshops adapted to internet language.

Books from CAEM

Collection which has been, through the years, reviewed and expanded.

IME Publishing and agreement with the Livraria da Física:

Real Numbers, Jorge Aragona, 2010

Groups, Bodies and Galois Theory, Paulo A.Martin, 2010

Applications of Topology to Analysis, Chaim Samuel Honig, 2011, reedited.

Ordinary Differential Equations, Jorge Sotomayor, 2011, reedited.

An Intro to the Theory of Gröbner Bases to Associative Algebras, Alexey A.Villas Bôas and Eduardo do N.Marcos, 2013.

Programs of Kits "Adventures in Science"

Leaded by professor Moyses Nessensveig(UFRJ) along with professors from USP. Professor Eduardo Colli contributed representing the discipline of Mathematics.

CEPID Neuromat: Released the first module of the free software: "Neuroscience Experiments

System"(NES), for the organization, in control and in management of neurophysiological data, clinical and experimental.



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CEA: Each project of statistical analysis developed at CEA is documented through a report of statistical analysis and divulged in the portal of the CEA

CCSL: Chapter from the book Journey of Update in Informatics of the Brazilian Computation Society of 2011, "Free Software and INtellectual Property: Juridical Aspects, Licences and Business Models".
Some projects in production at CCSL

ACHUSP: Website for lost and found for USP

AcMus: acoustic of rooms for musical production.

Archimdes-The open CAD: development of CAD systems.

Arquigrafia: social network for the collaborative construction of a digital collection of images of the Brazilian architecture.

Baile: development and use of coreographies of web services in environments of large scale.

Borboleta: mobile computation for the house attending in programs of Public Health

CoGrOO(Gramatical corrector for the OpenOffice.org): detection of gramatical errors for portuguese language.

Colmeia: informatization of the activities of a universitary library(functioning in IME's Library)

EGene: generation of automatic pipelines for the analysis of DNA sequences.

Groupware Workbench: kit of software components for the construction of applications at Web 2.0.

iCG: simple model that demonstrates how a computer works and how it is possible to construct a compiler for it.

InteGrade: computation in grid using techniques of orientation to objects.

Kalibro: metric analysis of source-codes.

MedSquare: exploration of medical images.

MetricMiner: mining of data repositories.

Mezuro: comparison of projects of free software.

MootiroMaps: web app for collaborative mapping and georeference.

OnAIR(Ontology Aided InformationRetrieval): searchers in natural languages about data banks of video.

scrptLattes: extraction of info from platform Lattes of CNPq

2.10.2.4 What is the participation of Graduate and Undergraduate students in the School's extension programs?

R: All the activities of Culture and Extramural of the Institute involve undergraduate or post-graduation students. To begin with the interns from the Centers, who develop the academic activities along with the docents.

The involvement may occur also in other ways. For instance, we have mention the strong link of the projects of the CCSL with the works made by the students in the disciplines "eXtreme Programming" and "Free Software Developmetn". Or yet the organization of the SELIC(Lincensure Week), biennially, by the students, with activities focused to teachers of the primary and secondary school, counting with the participation of the CAEM. Or yet the orientation work of the students in the expositions of Matemateca or in the IME stand at the Professions Fair. Or the participation of post-graduation students in the creation of the NES software of the CEPID Neuromat (see 2.10.2.3).

In the case of CAEM, one of the atributions that its two interns have is the elaboration and aplication of a semiannual workshop. In that case, jus as tin the other Centers of IME, the interns not only get involved with acitivity-mean but also with the activity-end.

2.10.2.5 Report on the culture and extension centers linked to the School and their contribution to academic development.

R: As said in the beginning, IME has formed, throughout the years, many Centers dedicated to the activities of Culture and Extramural. We will speak about them:

Center of Competence of Free Software(CCSL)

CCSL is at the same time a Center for research about free software and a great disseminator of



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information about free software to the community, aiming to foment its use and development. The CCSL building was inaugurated in August 2013, when the Center was already functioning.

CCSL holds many projects, which may be seen in its web page. It promotes lectures with guests from outside, either from companies and from abroad, including names of renowned fame and prestige. It participates of many agreements and projects of integration of entities.

Center of Applied Statistics (CEA)

The main activities of the CEA are related to the elaboration of projects of statistical advisory and aid in the planning of studies that involve the gathering and analysis of data. It gives support in a systematic way to researchers from USP who seek help from the department of Statistics for the data analysis of their projects. CEA also provides logistic support for docents of the department in their extramural activities. Such activities may generate substantial resources that are directly or indirectly given to IME, through agreements celebrated between the companies involved and FUSP.

Center for Improvement of the Teaching of Mathematics (CAEM)

CAEM was created in 1985 with the goal to promote activities and realize projects aiming the improvement of the teaching of mathematics in primary and secondary school.

The teachers of mathematics of the public school constitute, in its majority, its target-audience.

Center of Diffusion and Teaching Matemateca

This center was created at the end of 2013, officializing the 10 year project created by docents of IME. It is a collection of objects focused on the dissemination of the mathematics which are exposed at IME and other places.

Center of Computation Teaching (CEC)

Nowadays it only serves as support to the undergraduate courses, while it adequates its reports of extramural courses.

Service of Institutional Support (SVAPIN)

In the end of 2011, with the organizational chart restructuring at IME, it was created the SVAPIN, with attributions of: (i) management of website, analysis and development of systems of administrative support; (ii) Management of Communication, Press Advisory and Public relations, published in the internal newspaper "Acontece no IME", and other publishings in media elsewhere; (iii) Supervision of the activities of the Section of Digital Production (reservations for audiovisual equipments and rooms) >

Center of Applied Mathematics and Computation (CEMCAP)

Works along the companies and entities interested in applied mathematics and computation. Its status is inoperative.

Internationalization

2.11.1 Analyze the internationalization of core activities and its impact on the School's performance in the last 5 years

R: The Institute of Mathematics and Statistics of the University of São Paulo has always developed activities devoted to internationalisation, ensuring their presence in the specialised international community. These activities have been shaped as research cooperation agreements, mobility programmes and hosting of post-doc researchers. The Institute of Mathematics and Statistics created in May 2011 the International Relations Office, which has organised and structured all activities and information related to internationalisation, this way contributing to the growth of all activities that were already under development. The results of this growth can be observed by the upscaling acknowledgment of the Institute by the specialised international community, as well as by increasingly positive positioning of the Institute and of the University as a whole in international rankings of academic assessment.

2.11.2 Indicate and analyze the student, faculty and administrative modalities

R: Internationalisation IME: During the period 2010-2012, was consolidated in three directions: a) implementation and induction of the Committee on International Relations at the Institute of Mathematics



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and Statistics, University of São Paulo, as institutional growth strategy and qualification of academic activities, (b) a significant expansion in the number of undergraduate students interested in participating in the International Exchange Program, which are federal programs or institutional programs; c) an increase in the dissemination and training of programs, measured by the increase opportunities and incentives Internationalization of the University of São Paulo. During this period, there was an increase of 80% offers to exchange. Parallel to the growth in supply, it is appropriate to examine the impact of these trends on academic achievement term for our graduates, encouraging it to engage in research projects. Draws attention initially, the story of the students regarding their experiences abroad, pointing out that there was a greater level of trust and consistency of academic disciplines that have been studied, as well as an initiative to further studies Master's and / or doctorate abroad, there are relevant considerations in terms of learning a new language and capacity for autonomy to manage conflicts, turning students into future better prepared for the labor market professionals.

During the period 2012/2014 , involved the development of the activities already initiated in the previous administration , as well as a significant increase in the implementation of the International Covenants Academic signed with foreign institutions , monitoring of exchange students and support research projects , there was also an evolution the receipt of foreign delegations for the purpose of presentation and possible projects. Consolidation: a) systematize and enhance the mobility of undergraduate students; b) structure and strengthen the office of international relations so you can meet present and future needs , c) select, prepare and disseminate information on international cooperation programs and initiatives; d) active promotion actions in order to give greater visibility to Crint / IME.

Administrative Actions

Promote actions in order to give greater visibility to CRINT/IME, present the CRINT events, receive foreign delegations , working in conjunction with International Exchange Agency of the University of São Paulo, in order to ensure the strategies established for Internationalisation and update the material for disclosure and maintain relationships to facilitate forms of reception and support for foreign students and support for Brazilian students who wish to participate in mobility programs , guidance to candidates for realization of mobility.

2.11.3 I identify the repercussions of international initiatives (workshops, missions, the involvement of students and professors in national and international scholarly exchanges, agreements).

R: Faculty members in the Institute of Mathematics and Statistics have participated actively in their international research communities. Among the activities developed by these researchers we have the organization of international conferences and workshops, and the establishment of research agreements and international mobility programmes. Many of the results reported in the previous sections in this document result from the individual effort of faculty members. Since 2011, these actions have been supported and put forward by the Institute of Mathematics and Statistics, through the International Relations Office.

2.11.4 I identify international strategies.

R: The strategy for a growing international presence of the Institute of Mathematics and Statistics is to intensify and strengthen the activities already under development.

2.11.5 I identify the main management and infrastructure demands related to meeting the School's internalization strategies.

R: Despite the acknowledgment from the Institute of Mathematics and Statistics of the importance to ensure and broaden their international presence, as well as the acknowledgment of the importance of the support from the International Relations Office to pursue these actions and goals, this Office has not been



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included by the institution as part of their formal and organizational structure. An important request to ensure that the activities of the International Relations Office can be developed is to include it formally in the structure of the Institute, so that it can have its own budget and administrative autonomy to act more effectively.

INSTITUTIONAL PLAN (GOALS AND ACTIONS)

Institutional Plan (Goals and Actions)

3.1.1 Relate and comment on the primary goals and actions proposed by the School for the medium and long terms (5 and 10 years) concerning:

a) Management;

R: Due to the recent implementation by the University of a plan to reduce the number of administrative employees and other factors, the Institute lost 19 technical and administrative staff in the past 18 months. In the same period, the Institute also lost a significant number of faculty members, mainly due to retirement, and had an increase of teaching load. The problem of lack of faculty members is concentrated in the Department of Mathematics and the lack of technical and administrative staff in various sectors and departments. These facts require re-engineering management, especially with regard to the administrative processes, and hiring personnel, particularly faculty. The hiring of tenure-track assistant professors has been requested to the administration of USP. As for administrative re-engineering, we have been automating various internal processes. This process should continue in the coming years. We are also doing an internal reallocation of employees and tasks to balance the demand for services and servers in the different sectors of the EMI. Finally, it should be emphasized that the direction of the Institute remains committed to the plan and the management initiatives of its various departments and centers.

b) Infrastructure;

R: IME's main problem for a long time has been the lack of physical space for the better carrying out its activities. There is not enough office space for faculty, graduate students and postdocs, nor a big enough auditorium. Roughly six years ago, the design of a master plan for the expansion of the Institute has begun. Today we have a basic design, done in collaboration with the University main office for physical space. But there is no funding available. Currently the Institute has sought funding from the private sector. Unfortunately two factors: the complex legislation for the administration of private donations by the University and the Institute and the financial crisis of the country have interfered in this task. We will continue insisting on obtaining both public and private resources. The goal is (and has been for years) the carry out the master plan. The actions for the coming years are: (1) adequacy of a temporary space for a cafeteria, (2) reform of the computing infrastructure for research (FAPESP funding) and (3) readjustment of library space to the changes arising from the internet and computerization (FAPESP funding).

c) Technical and administrative employees;

R: The goal is to optimize the ratio "demand for services / number of staff members" maintaining peace and harmony among people of the IME community. The actions will be: (1) To provide training and education to employees, (2) To continue the automation of administrative processes where appropriate, (3) To hire new qualified employees, (4) To exchange personnel among sectors to harness their potential



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and (5) To improve the English language skills of the staff.

d) Faculty;

R: The Institute will continue to give support to the policies and initiatives of its departments, as long as they are balanced and contribute to the achievement of the main objectives of the University. Fair demands of the Departments, as for example Mathematics Department's request of hiring new faculty, will be given institutional support.

e) Teaching and learning processes;

R: The Institute's departments have a long tradition of modernizing teaching and learning processes. In the IME, the heterogeneity of educational processes can be seen when we compare the "Licenciatura" in Mathematics (Mathematics teachers' degree program), the BA in Computer Science and the interdisciplinary bachelor's degree in Applied and Computational Mathematics. The goals of the Institute are: to encourage the sharing of educational experiences among undergraduate programs and support new educational initiatives of the departments. The actions are: maintaining a permanent dialogue among the departments through the Undergraduate Education Committee and provide human and financial infrastructure to good pedagogical projects. Much of this financial support will be given through the payment of trainees, often students of IME, to assist in carrying out the projects.

f) Student body;

R: Here the main IME goals are: (1) To improve the process of selection of new undergraduate students of various courses (see reports MAT and MAC for criticism of the current entrance examination), (2) To reduce the number of dropouts, especially among the undergraduate (3) To follow up the career achievements of our graduates, in order to improve the evaluation process of the undergraduate programs, (4) To reduce the average time spent to get a degree, especially at the undergraduate level and (5) To increasing internationalization. The main actions of the Institute will be: (1) To try alternative forms of entry of freshmen, such as national high school examination ENEM (as suggested by three of the departments), and / or make changes to the college entrance examination in order to select students with friendlier more talented to Mathematical Sciences (as suggested by the Computer Science Department), (2) Stimulate activities related to undergraduate education at the Institute itself, such as Scientific Initiation, RA-ships, trainee opportunities, together with a control to avoid premature traineeship outside the University, (3) To conduct activities that better inform high school students about the IME undergraduate programs, as for example, the so-called "Career Fair", exhibitions of Matemateca, talks to high school students by the IME faculty and students, (4) To try to improve the comfort of the physical installation of the Institute in order to encourage the students to spend more time at the University, (5) To continue to seek more scholarships for graduate students and (6) To increase the number of undergraduates that do exchange abroad.

g) Undergraduate Program;

R: Most goals and actions mentioned in the previous item of course apply also here. We should also say that several undergraduate programs of IME have undergone recent reformulations (see, eg, the reports from the Applied Mathematics and the Statistics Departments), and it is their goal, and thus also IME's, to assess the effects of those changes in the next years. Other programs are also in the process of evaluating modifications made in the past and may make further modifications soon (see the Applied Mathematics Department report). Anyway, it is a goal of this Institute to continue to support the good



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initiatives of its various departments as far as possible. It is important to mention that the IME teaches many classes to other Institutes of USP, roughly 15,000 enrollments annually, and that IME also tries to follow the reformulations requests of those disciplines, as, for example, the one recently made by the Polytechnic School.

h) Graduate Program;

R: The main goals of the Institute, in line with their departments, are (see also item f "Corpo Docente"): (1) increasing the quality of the programs and consequently the CAPES ranking, (2) increasing internationalization, which is already quite reasonable and (3) attracting good students. The main actions in these directions are and will be: (1) better advertising of the programs, taking advantage of the intense national and international exposure of its faculty through lectures and other forms of exchange and (2) encouraging the participation of students in research visits and conferences. Again, this Institute will aim to support the good initiatives of its various departments that tend to improve the quality of their graduate programs.

i) Research;

R: The goal of IME is to improve research mainly from a qualitative point of view. The main actions will be: (1) To continue to encourage our faculty to go on research visits at other institutions in Brazil and abroad, (2) To encourage and support the visit of foreign scholars to IME, (3) To renovate the space and the services of the Library (4) To improve and if necessary to expand, the "Section of Agreements and Projects" to better assist faculty in preparing applications to funding agencies and organizing scientific events.

j) Culture and extension;

R: The goals are: (1) To improve installations for the initiatives that need it, such as the CAEM and the Matemateca, (2) To implement the Matemateca's plans to occupy walls of circulation spaces with pieces and posters, thus creating an innovative museum environment in a traditional space, which hopefully will attract students and people from outside the Institute, and (3) To increase the visibility of outreach initiatives, keeping the webpage always updated. The actions are and shall be: (1) The IME will continue to support their centers that conduct extension activities and all the good initiatives of the faculty in this direction, (2) The Commission for Culture and Extension will give not only institutional support, but widen articulation and advertising of all extension initiatives, using its space on the Institute's webpage and the help of the Institute's press office, and (3) The Extension Commission has its own agenda, as can be seen in Section 2.10.

k) Internalization.

R: Here the main goals of IME are: (1) To encourage and consolidate our participation in the international student exchange of program, (2) To improve the administrative procedures for welcoming foreign guests at IME and USP, and (3) To enhance the visibility of the Institute abroad. Our actions are and will be: (1) To improve the English version of our website, (2) To encourage the participation of undergraduate students in exchange programs, (3) To encourage faculty members and research groups to establish research partnerships with foreign institutions, (4) To encourage the offering English language courses for both undergraduate and graduate students, observing, of course, the University regimental restrictions, and (5) To request that the central administration try to ease some of the bureaucratic procedure faced



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by foreign guests, both internal and external (Federal Police, Embassies).

3.2 Explain the main indicators to be used for monitoring goals and actions proposed by the School.

R: We believe that the following indicators are important. To evaluate undergraduate programs: (1) number of students per class and number of classes (students) under the responsibility of each faculty member per year (2) rates of passing grades and dropouts, (3) teaching assessment by the students (something still to be implemented at USP effectively), and (4) assessment by the graduates of the undergraduate programs (something to be implemented at USP, possibly by sampling). Graduate programs are already evaluated by the federal agency CAPES. For the research: (1) Number of published articles, quotes, etc, average per faculty (2) Ranking of the journals where the papers were published according to the CAPES classification, (3) Number of faculty with CNPq research fellowship (grants) and their respective CNPq ranking, (4) Awards and distinctions and (5) Research quality assessment by peers each time the analysis of the numbers are disputed (the numbers are often not useful to evaluate the desired exceptional cases). For extension: (1) Numbers of implemented extension actions, (2) Number of people benefited by those actions, and (3) Quality Analysis of extension services by specialists.

OTHER COMMENTS

OTHER COMMENTS (if any)

R: The institutional evaluation, as well as all the USP management process, would be greatly benefited by a computer system that would allow the continuous inclusion and analysis of data on the activities of USP. The "Tycho" system is a first step in this direction, nevertheless it needs an improvement in order to include more data, particularly some on the evaluation of courses by students. In the future, it would be recommended that the evaluation process would be based on the several activities done by the Institute and synthetically registered in that computer system, and not based on a long, and sometimes verbose, report on these activities. Qualitative information, inexpressible by numbers, "could be" given in a small report. The possible questions resulting from the analysis of the numbers and the report could be answered directly by the representatives of institute and the departments.