

Open tenured position at the Statistics Department at the Institute of Mathematics and Statistics (IME) – University of São Paulo (USP)

ATAc Announcement – 020/2024

****OPENING OF APPLICATIONS FOR THE PUBLIC COMPETITION OF TITLES AND EXAMS AIMED AT FILLING ONE (1) POSITION OF DOCTORAL PROFESSOR IN THE DEPARTMENT OF STATISTICS AT THE INSTITUTE OF MATHEMATICS AND STATISTICS OF THE UNIVERSITY OF SÃO PAULO****

The Director of the Institute of Mathematics and Statistics of the University of São Paulo hereby informs all interested parties that, in accordance with the decision made by the Congregation in its 657th ordinary session held on March 21, 2024, applications are open for a period of 60 (sixty) days, starting at 9 AM (Brasília time) on April 8, 2024, and ending at 5 PM (Brasília time) on June 6, 2024, for the public competition of titles and exams for the provision of one (1) position of Doctoral Professor, reference MS-3.1, in the Full-Time Teaching and Research Regime (RDIDP), position number 1262033, with a salary of BRL 14,761.02 (as of May 2023), at the Department of Statistics, in terms of Article 125, paragraph 1, of the General Regulations of USP.

The teaching test will be conducted in a subject that the candidate must specify in writing at the time of registration, to be entered in the system available at the link <https://uspdigital.usp.br/gr/admission>, in the tab for the memorial's proofs, among the following subjects of the postgraduate program in Probability and Statistics at IME-USP:

MAE5702 – Probability and Statistical Inference I and

MAE5905 – Introduction to Data Science.

If the subject is not specified by the candidate, the teaching test must be conducted mandatorily on the MAE5702 program.

Subjects:

MAE5702 – Probability and Statistical Inference I

Module I - Probability:

1. Probabilistic models and probability calculation: axioms, elementary properties, discrete and combinatorial modeling, continuous modeling, and integration.
2. Variables, random vectors, distributions, and moments: conceptualization and special model families, both uni and multivariate.
3. Independence and conditioning: conceptualization and examples.
4. Distributions of transformations of random vectors.

5. Distributions of statistics in samples from normal populations: the chi-squared, F, and t distributions, orthogonal transformations.
6. The law of large numbers and the central limit theorem.

Module II - Mathematical Statistics:

1. Basic concepts: statistical models, estimation, hypothesis testing, and other classic inference problems.
2. Estimation methods: substitution methods, least squares, maximum likelihood, and applications.
3. Criteria for evaluating estimators: the Cramer-Rao inequality; minimum variance estimators, efficiency, and asymptotic efficiency.
4. Confidence intervals: conceptualization, interpretation, and construction.
5. Hypothesis tests: the Neyman-Pearson lemma, composite hypotheses, the power function, likelihood ratio tests, and the SPRT.
6. Tests for means and variances in normal populations: comparison of populations and the Behrens-Fisher problem.

MAE5905 – Introduction to Data Science

1. Statistics, Computing, and Data Science.
2. Statistical learning: supervised and unsupervised.
3. Supervised learning: regression and classification.
4. Unsupervised learning: clustering analysis, dimension reduction (principal components, independent components, singular value decomposition): concepts.
5. Support vector machines
6. Tree-based methods
7. Computational tools: the R repository.
8. Analysis of massive data sets (Big Data).
9. Examples of applications to data sets.

The competition will be governed by constitutional principles, notably that of impartiality, as well as by the provisions of the Statute and the General Regulations of the University of São Paulo and the Regulations of the Institute of Mathematics and Statistics.

Application Requirements:

1. Applications must be made exclusively through the link <https://uspdigital.usp.br/gr/admission> during the indicated period, and the candidate must fill in the requested personal data and attach the following documents:

I – a detailed memorial and proof of published works, activities relevant to the competition, and other information that allows the evaluation of their merits, in digital format;

II – proof of holding a Doctoral degree awarded by USP, recognized by it, or of national validity;

III – proof of discharge from military service for male candidates;

IV – certificate of electoral discharge or detailed certificate issued by the Electoral Justice less than 30 days from the start of the registration period;

V – official identity document.

VI - Research Project explicitly characterized and focused on one of the following areas, in which the candidate presents details of a research line to be developed during the probationary stage, if appointed. Specify the chosen research project area (number and letter) in digital format:

1. Probability

- a. Inference for Stochastic Processes
- b. Martingales in Reliability Theory
- c. Stochastic Modeling of Interacting Systems
- d. Probability Theory

2. Statistics

- a. Survival Analysis
- b. Multivariate Analysis and Copulas
- c. Bayesian Inference
- d. Generalized Linear and Mixed Models
- e. Theory of Statistics

3. Data Science

- a. Statistical Learning and Data Science
- b. Biostatistics
- c. Time Series, Wavelets, and High-Dimensional Data

If the Research Project area is not specified by the candidate, the research project presentation must be conducted, mandatorily, in areas 1.d and 2.e.

Regulatory Details:

§ 1 - Supporting elements of the memorial referred to in section I, such as maquettes, artworks, or other materials that cannot be digitized, must be presented by the last business day preceding the start of the competition.

§ 2 - Links from Dropbox, Google Drive, or any other that could be altered by the candidate will not be accepted as proof of the items listed in the memorial.

§ 3 - For the purposes of section II, defense minutes without information on approval will not be accepted if the award of the Doctorate degree depends on this provision by the awarding

Educational Institution, and the candidate is hereby notified that failure to provide such proof will result in the rejection of their application.

§ 4 - Faculty members currently employed at USP will be exempt from the requirements listed in sections III and IV, provided they have previously proven compliance at the time of their initial contract.

§ 5 - Foreign candidates will be exempt from the requirements of sections III and IV, provided they can prove they are legally residing in Brazil.

§ 6 - A foreign candidate who passes the competition and is recommended for appointment can only assume their position if they present a temporary or permanent visa that allows for paid activity in Brazil.

§ 7 - At the time of application, candidates with disabilities must request the necessary accommodations for taking the tests.

§ 8 - It is entirely the responsibility of the candidate to upload each of their documents in the specific field indicated by the system available at the link <https://uspdigital.usp.br/gr/admission>, and the candidate is hereby notified that uploading documents in a different order than that established will result in the rejection of their application.

§ 9 - It is entirely the responsibility of the candidate to ensure their documents are complete (front and back) and in a legible file, and the candidate is hereby notified that failure to rectify any irregularity regarding incomplete or illegible document uploads during the application period will lead to the rejection of their application.

§ 10 - Late submission of documents by the candidate, even on appeal, will not be accepted.

§ 11 - At the time of application, a candidate who self-identifies as Black, Brown, or Indigenous will express their interest in participating in the differentiated scoring outlined in section 9 and its paragraphs of this Announcement.

§ 12 - To be eligible for the bonus for self-declared Black and Brown candidates, the candidate must possess phenotypical traits that characterize them as Black or Brown.

§ 13 - The self-declaration as Black or Brown made by the candidate who expresses interest in participating in the differentiated scoring will be subject to confirmation through a heteroidentification panel.

§ 14 - In the event the self-declaration of racial belonging is not confirmed, the candidate will be eliminated from the competition, and if they have been appointed, they will be subject to the annulment of their admission to public service or employment, following an administrative procedure in which they are assured due process and the right to a full defense, without prejudice to other applicable sanctions.

§ 15 - To confirm the self-declaration of an Indigenous candidate, the Indigenous Birth Registration - Rani of the candidate or, in its absence, the Indigenous Birth Registration - Rani of one of their parents will be required at the time of application.

§ 16 - Exceptional cases may be assessed by the Council of Inclusion and Belonging, which may admit the confirmation of the self-declaration of the candidate as Indigenous through, cumulatively, a memorial and an ethnic belonging statement signed by chiefs, tuxauas,

Indigenous leaders from communities, associations, and/or organizations representing the Indigenous peoples of the respective regions, under the penalties of the law.

§ 17 - The current norms for presenting documents related to self-declaration as Black, Brown, and Indigenous, as well as for their confirmation, are available on the website of the General Secretariat of USP (<https://secretaria.webhost.usp.sti.usp.br/?p=12343>).

§ 18 - For the purposes of section III, the documents listed in Article 209 of Federal Decree No. 57.654/1966 will be accepted, with male candidates who have reached 45 years of age by December 31 of the year prior to the opening of applications being exempt.

§ 19 - At the time of application, the candidate may express their intention to take the exams in English, in accordance with Article 37, paragraph 2 of the Regulations of the Institute of Mathematics and Statistics. The contents of the exams conducted in English and Portuguese will be identical.

2. The applications will be judged by the Congregation of the Institute of Mathematics and Statistics, in its formal aspect, with the decision being published in a public notice.

Sole Paragraph - The competition shall be held within thirty to one hundred and twenty days from the date of publication in the State Official Gazette of the approval of the applications, in accordance with Article 134, sole paragraph, of the General Regulations of USP.

3. The tests will consist of:

I - Evaluation of the memorial, to be written in Portuguese or English, with a public defense - weight 50;

II - Teaching test - weight 25;

III - Presentation of a research project, to be written in Portuguese or English, in digital format, submitted at the time of registration - weight 25.

§ 1 - The announcement of the candidates for the tests will be published in the State Official Gazette.

§ 2 - Candidates who present themselves after the established time will not be allowed to take the tests.

4. The evaluation of the memorial, expressed through a global score, including defense and assessment, should reflect the candidate's merit.

Sole Paragraph - In the evaluation of the memorial, the committee will consider:

I - Scientific, literary, philosophical, or artistic production;

II - University teaching activities;

III - Activities related to community service;

IV - Professional or other activities, as applicable;

V - Degrees and other academic honors.

5. The teaching test will be public, lasting a minimum of forty and a maximum of sixty minutes, and will cover the syllabus of the aforementioned area of knowledge, as per Article 137 of the General Regulations of USP.

I - The judging committee, based on the competition program, will organize a list of ten topics, which the candidates will be informed of immediately before the topic draw;

II - The candidate may propose the replacement of topics immediately after becoming aware of their statements if they believe they do not belong to the competition program, and the judging committee will decide immediately on the validity of the claim;

III - The test will be held 24 (twenty-four) hours after the topic draw, during which the candidate will have free time without being required to perform other activities;

IV - The candidate may use the teaching materials they deem necessary;

V - If the number of candidates requires, they will be divided into groups of up to three, in the order of registration, for the purposes of the draw and the test;

VI - When the 60th minute of the test is reached, the Judging Committee should interrupt the candidate;

VII - If the candidate's presentation ends before the 40th minute of the test, the examiners should give the candidate a zero score for that test.

6. The evaluation of the Research Project follows the following stages:

I - The candidate will have ten to twenty minutes for the oral presentation of their research project;

II - Each examiner will have up to fifteen minutes to question the candidate, ensuring equal response time for the candidate;

III - After the questioning, each examiner will assign a score on a specific form, considering the objectives presented in the Research Project.

7. The test referring to the presentation of the Research Project will consist of questioning about the mentioned project and should objectively analyze:

I - Adequacy to one of the research lines in the area in which the Research Project was explicitly characterized;

II - Originality and relevance;

III - Feasibility in light of the existing infrastructure in the Unit.

8. The test scores may vary from zero to ten, rounded to the first decimal place.

9. At the end of the evaluation of the tests, each candidate will receive a final score from each examiner, which will be the weighted average of the scores given, considering the weights specified in item 3 and the possible application of differentiated scoring according to the paragraphs of this item.

§ 1 - The formula for calculating the differentiated score to be assigned to black, brown, and indigenous candidates is:

$$DS = (MAS - MCBI) / MCBI$$

Where:

- DS is the differentiated score to be added to the scores of all black, brown, or indigenous candidates who expressed interest in participating in the differentiated scoring.
- MAS is the average score of the broad competition among all candidates who scored, excluding the disqualified ones, i.e., those who did not reach the minimum score referred to in item 11 of this Notice. "Broad competition" includes all candidates who scored and who did not declare themselves as black, brown, or indigenous, and those who, having declared themselves black, brown, or indigenous, opted not to participate in the differentiated scoring.
- MCBI is the average score of the black, brown, and indigenous competition among all candidates who scored, excluding the disqualified ones.

§ 2 - The formula for applying the differentiated score to the final scores of black, brown, and indigenous candidates is:

$$NFCBBI = (1 + DS) * SSCBBI$$

Where:

- NFCBBI is the final score of the public competition, after applying the differentiated score, which will generate the candidate's ranking in the public competition stage, limited to the maximum score provided in the notice. At the end of the public competition, the final score becomes the candidate's simple score.
- SSCBBI is the beneficiary candidate's simple score, on which the differentiated score will be applied.

§ 3 - The calculations referred to in §§ 1 and 2 of this item must consider two decimal places, and fractions greater than or equal to 0.5 (five-tenths) must be rounded up to the next whole number.

§ 4 - The differentiated score (DS) provided for in this article applies to all qualified beneficiaries, i.e., those who have achieved the minimum performance established in the competition notice, considering, for this last purpose, the simple score.

§ 5 - In the absence of qualified beneficiaries of the differentiated score among the qualified candidates, the differentiated score will not be calculated.

§ 6 - The differentiated score will not be applied when, in the formula for calculating the differentiated score (DS), the MCBI (average score of the black, brown, and indigenous competition) is higher than the MAS (average score of the broad competition).

10. The result of the competition will be announced by the judging committee immediately after its conclusion, in a public session.

11. Candidates who obtain a minimum final score of seven from the majority of the examiners will be considered qualified.

12. The indication of candidates will be made by each examiner, according to the scores given by them.

- 13.** The candidate who obtains the highest number of indications from the judging committee will be proposed for appointment.
- 14.** The appointment of the nominated candidate will be subject to approval in a medical examination conducted by the State Medical Expertise Department (DPME), in accordance with Article 47, VI, of Law No. 10.261/68.
- 15.** The appointment of the approved professor in the competition and other resulting actions will be governed by the terms of Resolution No. 7271 of 2016.
- 16.** The professor in RDIDP must maintain exclusive employment with USP, in accordance with Article 197 of the General Regulations of USP.
- 17.** The competition will have immediate validity, and only the candidate indicated for the position will be proposed for appointment.
- 18.** The candidate will be summoned for the appointment through the State Official Gazette.
- 19.** Further information, as well as the relevant regulations, are available to interested parties at the Academic Technical Assistance of IME, located at Rua do Matão, 1010 - Block A - Ground Floor, room 33, or can be obtained by phone (11) 3091-6104 or by email: ataac@ime.usp.br. To consult the notice, visit www.ime.usp.br.

To view the announcement in Portuguese, visit www.ime.usp.br.