Graduate Program in Mathematics
Admission - GRE DI CODE 2348

The ICMC Graduate Program in Mathematics is one of eligible graduate programs of the USP and FAPESP joint initiative to enroll PhD students at USP most qualified graduate programs.

The GRE DI Code for USP is **2348**, which allows you to choose the graduate program.

As additional requirements for selection, the ICMC Graduate Program in Mathematics requests that the candidates to sent two recommendation letters, curriculum vitae and official school results summary.

More information about the process in www.prpg.usp.br/index.php/pt-br/gre-2/usp-gre-2

Research areas and supervisors

Linear Partial Differential Equations (Adalberto Panobianco Bergamasco)

Abstract: The main topics studied in this research area are: (a) Local, semi-global and global solvability for linear differential operators and involutive systems of complex vector fields; (b) Regularity properties of the solutions: C^∞, analytic and Gevrey hypoellipticity.

Singularities (Farid Tari, Marcelo José Saia, Maria Aparecida Soares Ruas)

Abstract: Singularity theory has wide applications to various areas of mathematics and in particular to differential geometry and qualitative theory of differential equations. These branches of mathematics feedback, in turn, into and enrich singularity theory. The aim of this project is to develop methods of classification of real and complex singularities with special attention to invariants and equisingularity conditions for families of sets and mappings, and to apply singularity theory to problems in differential geometry and differential equations.

Algebraic, Geometric and Differential Topology (Oziride Manzoli Neto)

Abstract: This project consist in develop research in five areas which are part of Geometry/Topology: (a) Fixed Point and Coincidence Theory; (b) Bordism $(Z_2)^k$-equivariant and Group Cohomology; (c) Topology of the Manifolds; (d) Bordism and Homotopy Theory; (e) Braid Groups; Topological data analysis. The problems to be studied in each sub-area represent relevant contribution for the development of the sub-area. To exemplify: the study of the coincidence theory for spaces with different dimension, the study of braid groups of surfaces and braids on orbit spaces, $(Z_2)^k$ equivariant bordism, fixed point of involutions, properties of generalized manifolds, Borsuk-Ulam type theorems, torsion invariants, classification problems in geometric topology and cobordism, reconstruction of manifolds using barcodes and application of TDA to Biology.

Ordinary Differential Equations (Tiago Pereira da Silva)

Abstract: In a series of recent works, the supervisor and colleagues found evidence that non-ergodicity of a chaotic Hamiltonian system universally leads to entropy growth and, consequently, the exponential growth of energy during a periodic oscillation parameters. In this project, we aim at building a rigorous mathematical theory to describe this phenomenon. This is an important step towards understanding the dynamics Hamiltonian. We will replace the theorem of Anosov-Kasuga by a general principle of averages that applies to any Hamiltonian system, not only the ergodic.

Applied Functional Analysis, Approximation Theory and Applications (Valdir Antonio Menegatto)

Abstract: Analysis on the sphere and manifolds: to study a few relevant problems that belong to the intersection of the analysis on the sphere and approximation theory, mainly those involving positive definite kernels and their associated integral operators. The focus will be on problems that have some potential for applications. That includes these ones.

- Positive definite and related kernels: to consider classes of positive definite functions that are useful in approximation theory, in particular those attached to interpolatory processes. Further, to analyse possible implications in the theory of integral operators.- Strictly positive definite kernels: to obtain characterizations for the strictly positive definite kernels in several contexts, including the case of matrix valued kernels and operator valued kernels. To consider possible applications in statistics and geo-mathematics.

- To consider the very same problems quoted above in other settings: compact two-point homogeneous spaces, tori and cartesian products of manifolds.