Titolo del corso (in Inglese)	Interpolation and approximation with applications
Sottotitolo (in Inglese)	Orthogonal Polynomials in Sobolev Spaces. Applications
Referente proponente *(un membro del Collegio dei Docenti)*	Francesco Dell'Accio
Docente/i *(Il corso può essere tenuto da uno o più docenti, interni – ivi incluso il referente - oppure esterni, purché di elevata qualificazione.)*	FRANCISCO JOSE MARCELLAN ESPAÑOL
Abstract generico del Corso (in Inglese)	The course aims to discuss advanced topics on both classic and new approaches to interpolation and approximation, mainly polynomial-based but not only, and their applications to the numerical solution of real world problems. The exact topics of the course may vary from year to year and will depend on both the research interests of the students attending it and on the instructor.
Abstract specifico del Corso (in Inglese)	The course will present the state of the art in the theory of orthogonal polynomials with respect to weighted Sobolev spaces associated with a vector of measures supported on the real line or a domain in the Euclidean space. A constructive theory in several cases will be emphasized. Analytic and algebraic properties of such polynomials will be discussed. Applications to Boundary Value Problems of linear differential operators of second order as well as to Sobolev-Fourier expansions in terms of such polynomials will be studied. Numerical implementations of the corresponding algorithms will also pointed out.
Elenco analitico degli argomenti (in Inglese)	1.- A basic background on orthogonal polynomials and linear functionals. Applications. 2.- Sobolev orthogonal polynomials. Motivations and an historical overview. 3.- Sobolev type orthogonal polynomials. The connection with bispectral problems. 4.- Coherent pairs of measures and Sobolev orthogonal polynomials. Analytic theory and applications. Sobolev-Fourier expansions: Convergence problems. 5.- Coherent pairs of measures of the second kind and Sobolev orthogonal polynomials.

	6.- Multivariate weighted Sobolev orthogonal polynomials. A constructive approach for measures supported on some domains in 2D and 3D Euclidean spaces, respectively. Applications to the Dirichlet problem.
Ore di didattica frontale prevista *(Per uniformità e al fine di agevolare l'organizzazione, risulta preferibile – sebbene non è da intendersi come vincolo – organizzare il corso su 12 ore complessive, articolate in 4/6 incontri.)*	6 incontri, da 2 ore ciascuno
Prova di verifica *(E' obbligatorio prevedere una prova finale. Essa può essere tuttavia articolata con flessibilità: progetti, orale, discussione di lavori scientifici, …)*	Projects associated with the contents of each session based on main references of the topic as well as the analysis of some specific problems (3 for each session).
Periodo di erogazione *(Riportare preferenza sul mese in cui deve essere erogato il corso)*	Dal 15 Maggio 2025 al 30 Maggio 2025