Syllabus Attività Formativa

Anno Offerta	2020
Corso di Studio	SM34 - MATEMATICA
Regolamento Didattico	SM34-18-19
Percorso di Studio	PDS0-2018 - comune
Insegnamento/Modulo	525SM - TOPICS IN ADVANCED ANALYSIS 2 - TOPICS IN ADVANCED ANALYSIS 2
Attività Formativa Integrata	-
Partizione Studenti	-
Periodo Didattico	S1 - Primo Semestre
Sede	TRIESTE
Anno Corso	2
Settore	MAT/05 - ANALISI MATEMATICA
Tipo attività Formativa	C - Affine/Integrativa
Ambito	20947 - Attività formative affini o integrative
CFU	6.0
Ore Attività Frontali	48.0
AF_ID	271880

Tipo Testo	Codice Tipo Testo	Num. Max.	Ob bl.	Testo in Italiano	Testo in Inglese
		Caratteri			
Lingua	LINGUA_INS	3800	Sì	English	English
insegnament					
0					

Contenuti	CONTENUTI	3800	Sì	The course considers advanced topics in	The course considers advanced topics in
(Dipl.Sup.)				partial differential equations.	partial differential equations.
				After an introductory part focused on	After an introductory part focused on
				harmonic analysis, the course	harmonic analysis, the course
				introduces various equations, such as Navier	introduces various equations, such as Navier
				Stokes and nonlinear	Stokes and nonlinear
				Schroedinger, and looks at the initial value	Schroedinger, and looks at the initial value
				problem.	problem.
				Preliminaries. Riesz 's Interpolation Theorem	Preliminaries. Riesz 's Interpolation Theorem
				and some applications. Maximal function .	and some applications. Maximal function .
				Marcinkiewicz Interpolation Theorem.	Marcinkiewicz Interpolation Theorem.
				Theorem by Hardy Sobolev Littlewood.	Theorem by Hardy Sobolev Littlewood.
				Sobolev's Embedding for homogenous spaces	Sobolev's Embedding for homogenous
				in R^n). Inequality of Gagliardo Nirenberg.	spaces in R^n). Inequality of Gagliardo
				Bochner Integral. Stokes Equation . Weak	Nirenberg. Bochner Integral. Stokes
				solutions, uniqueness, energy identity.	Equation . Weak solutions, uniqueness,
				Incompressible Navier Stokes Equations.	energy identity. Incompressible Navier Stokes
				Weak solutions. Leray 's Theorem on global	Equations. Weak solutions. Leray 's Theorem
				existece of weak solutions in dimensions 2	on global existece of weak solutions in
				and 3. Well posedness in Sobolev spaces.	dimensions 2 and 3. Well posedness in
				Leray 's Thorem of the uniqueness, well	Sobolev spaces. Leray 's Thorem of the
				posedness in 2D.	uniqueness, well posedness in 2D.
				In the 2nd part of the course we will	In the 2nd part of the course we will
				continue to focus on Incompressible Navier	continue to focus on Incompressible Navier
				Stokes Equations discussing theory by	Stokes Equations discussing theory by
				Caffarelli Kohn and Nirenberg, using the book	Caffarelli Kohn and Nirenberg, using the book
				by Robinson,Rodrigo and Sadowsky	by Robinson,Rodrigo and Sadowsky
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Testi di	TESTI_RIF	3800	Sì	Along with some instructor's notes, we will	Along with some instructor's notes, we will
riferimento				use the following bibliography	use the following bibliography
				1) Bahouri, Chemin, Danchin: Fourier analysis	1) Bahouri, Chemin, Danchin: Fourier analysis
				and nonlinear partial differential equations.	and nonlinear partial differential equations.
				Springer	Springer
				2) Cazenave, Haraux: An introduction to	2) Cazenave, Haraux: An introduction to
				semilinear evolution equations. Oxford	semilinear evolution equations. Oxford
				Univ.Press.	Univ.Press.
				3) Chemin, Desjardins, Gallagher, Grenier:	3) Chemin, Desjardins, Gallagher, Grenier:
				Mathematical Geophisics. Oxford Univ.Press.	Mathematical Geophisics. Oxford Univ. Press.
				5) Robinson, Rodrigo, Sadowski: The three	5) Robinson, Rodrigo, Sadowski: The three
				dimensional Navier Stokes Equations,	dimensional Navier Stokes Equations,
				Cambridge Univ. Press.	Cambridge Univ. Press.
				6) Stein: Singular Integrals and	6) Stein: Singular Integrals and
				Differentiability Properties of Functions.	Differentiability Properties of Functions.
				Princeton University Press.	Princeton University Press.
				7) Stein: analysis: real-variable methods,	7) Stein: analysis: real-variable methods,
				orthogonality, and oscillatory integrals.	orthogonality, and oscillatory integrals.
				Princeton University Press.	Princeton University Press.
Objettivi		2000	0)		The number of the second is to introduce the
formativi		3600	51	the purpose of the course is to introduce the	the purpose of the course is to introduce the
TOTTIALIVI				students to the topic of (mainly honinear)	students to the topic of (mainly nonlinear)
				partial differential equations showing on few	partial differential equations showing on few
				paradigmatic examples now they can be	paradigmatic examples now they can be
				treated thinking of them as	treated thinking of them as
				dimensional actting using tools of functional	dimensional actting using tools of functional
				aimensional setting, using tools of functional	aimensional setting, using tools of functional
				analysis and of narmonic analysis. The course	analysis and of narmonic analysis. The course
				is very advanced, and should be taken only by	is very advanced, and should be taken only by

				students with a strong background in	students with a strong background in
				functional analysis.	functional analysis.
Dronomylaiti		2000			
Prerequisiti	PREREQ	3800	51	Functional analysis, specifically Sobolev	Functional analysis, specifically Sobolev
				spaces and, broadly speaking, the topics of	spaces and, broadly speaking, the topics of
				the 1st year courses ADVANCED ANALYSIS	the 1st year courses ADVANCED ANALYSIS
				parts A e B.	parts A e B.
Metodi	METODI_DID	3800	Sì	The course consists of lectures during which	The course consists of lectures during which
didattici				the Instructor discusses all the details of the	the Instructor discusses all the details of the
				topics covered, answers student's questions	topics covered, answers student's questions
				and tries to get them involved. The students	and tries to get them involved. The students
				will receive before the lectures the lecture	will receive before the lectures the lecture
				notes of the Instructor.	notes of the Instructor.
Altre	ALTRO	3800	Sì	The lecture notes and other information will	The lecture notes and other information will
informazioni				be available through Moodle	be available through Moodle
Modalità di	MOD_VER_AP	3800	Sì	The exam consists of a student seminar of	The exam consists of a student seminar of
verifica	PR			about 30 minutes on a topic arranged with	about 30 minutes on a topic arranged with
dell'apprendi				the Instructor, during which the student will	the Instructor, during which the student will
mento				show whether or not is able to apply the main	show whether or not is able to apply the main
				ideas presented during the lectures by the	ideas presented during the lectures by the
				Instructor in specific and analogous contexts.	Instructor in specific and analogous contexts.
				The Instructor might ask some questions on	The Instructor might ask some questions on
				the topics covered during the course in class.	the topics covered during the course in class.
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Programma	PROGR_EST	3800	Sì		
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