

VERBALE DEL CONSIGLIO DELLA SCUOLA DI DOTTORATO DEL POLITECNICO DI BARI

Seduta n. 1/2018

del giorno 31 gennaio 2019

Il giorno 31 gennaio 2019 alle ore 16.00, a seguito di convocazione del 27/01/2019, si è riunito presso l'Aula della sezione Macchine ed Energetica del DMMM il Consiglio della Scuola di Dottorato del Politecnico di Bari, per discutere il seguente

ORDINE DEL GIORNO

1. Comunicazioni del Direttore.
2. Affidamento insegnamenti per il XXXIV ciclo.
3. Corsi aggiuntivi per il XXXIV ciclo.

Sono presenti:

	PROF			Presente	Assente giustific.	Assente
1	PROF.	ALBINO	Vito	X		
2	PROF.	CUPERTINO	Francesco	X		
3	PROF.	DE PALMA	Pietro	X		
4	PROF.	DEMELIO	Giuseppe Pompeo	X		
5	PROF.	GIGLIETTO	Nicola		X	
6	PROF.	MASTRORILLI	Pietro		X	
7	PROF.	MENGHINI	Anna Bruna		X	
8	PROF.	MOCCIA	Carlo		X	
9	PROF.	MOSSA	Michele	X		
10	Prof.	GRIECO	Alfredo	X		
11	DOTT.	MOTTA ZANIN	Giulia		X	

Alle ore 16.15, il Direttore, accertata la presenza del numero legale dei componenti, dichiara aperti i lavori del Consiglio. Viene nominato segretario il prof. Alfredo Grieco.

P.1) Comunicazioni del Direttore

Il Direttore comunica che la cerimonia di consegna dei diplomi di dottorato è prevista per il 28 febbraio. La cerimonia prevede l'intervento di alcuni ex dottorandi che si sono distinti nella loro carriera professionale e la consegna dei diplomi di dottorato agli studenti del XXXI ciclo in presenza del Magnifico Rettore e altri rappresentanti istituzionali. Per alcuni ex dottorandi

attualmente all'estero per motivi di lavoro, la Scuola effettuerà il rimborso delle spese per la partecipazione come relatore alla cerimonia sui fondi della Scuola di dottorato.

Il Direttore comunica che la Scuola di dottorato sta partecipando all'organizzazione di una Summer School sul Volo Suborbitale in collaborazione con diverse aziende del settore aerospaziale operanti sia in Puglia sia in USA ed Europa. Il periodo di formazione dovrebbe durare una settimana ed è rivolto a 30/50 utenti provenienti dal mondo dell'industria e della ricerca industriale e accademica.

P.3) Affidamento insegnamenti

Sono pervenute le seguenti domande in seguito al bando per la copertura di 25 insegnamenti emanato con D. R. n. 822 del 19.12.2018 nelle modalità indicate (titolo retribuito, TR; titolo gratuito, TG; devoluzione a dipartimento, DV):

INSEGNAMENTO	CFU	S.S.D.	Candidati	Ruolo	Tipologia	prot. n.	data prot.
Numerical approaches to solid and applied mechanics: Boundary Elements Methods (BEM)	3	ING-IND/13	Carmine PUTIGNANO	RTD-B ING-IND/13	supplenza retribuita	713	15/01/2019
Dynamical systems and chaos: theory	2	ING-IND/08	Stefania CHERUBINI	Professore associato ING-IND/08	supplenza retribuita con devoluzione al Dipartimento	952	18/01/2019
Dynamical systems and chaos: applications	2	ING-IND/14	Antonio PAPANGELO	Assegnista di ricerca	contratto	712	15/01/2019
Statistical mechanics with applications to materials science	3	MAT/07	Giuseppe FLORIO	RTD-B MAT/07	supplenza retribuita	618	14/01/2019
Calculus of variations with applications in continuum mechanics	3	MAT/05	Francesco MADDALENA	Ricercatore MAT/05	supplenza retribuita	890	17/01/2019
Mechanical characterization of materials by advanced ultrasonic tests	3	ING-IND/14	Anna CASTELLANO	Assegnista di ricerca	contratto	922 (PEC)	18/01/2019
Combustion processes and pollutant emissions	2	ING-IND/08	Elia DISTASO	Dottore di ricerca - dipendente privato	contratto	956	18/01/2019
Advances in Geomatics Engineering	3	ICAR/06	Eufemia TARANTINO	Professore associato ICAR/06	supplenza retribuita	758	16/01/2019
How to build an ontology that lasts	3	ICAR/20	Stefano BORGIO	Ricercatore CNR	contratto	106 (PEC)	04/01/2019

			Floriano SCIOSCIA	RTD-B ING-INF/05	supplenza gratuita	798 (PEC)	16/01/2019
Models and methods for logistics and sustainable transportation	2	ICAR/05	Mario MARINELLI	RTD-A ICAR/05	supplenza retribuita	870	17/01/2019
Statistical data analysis starting from the highway engineering case	2	ICAR/04	Paolo INTINI	Assegnista di ricerca	contratto	414	10/01/2019
Climate Change: Impacts & Responses. How vegetation causes an alteration of hydrological conditions and spreading process in natural flows	2	ICAR/01	Diana DE PADOVA	Ingegnere - esperto	contratto	216	08/01/2019
			Michele MOSSA	Professore ordinario ICAR/01	supplenza gratuita	445	10/01/2019
Elements of Probability for Engineering Sciences	3	ING-INF/03	Pietro CAMARDA	Ordinario Poliba in pensione	contratto	25990	21/12/2018
Reasoning on the Web of Data	3	ING-INF/05	Floriano SCIOSCIA	RTD-B ING-INF/05	supplenza gratuita	799 (PEC)	16/01/2019
			Simona COLUCCI	RTD-B ING-INF/05	supplenza retribuita	964	18/01/2019
Industry 4.0: Optimization, Control and Security	3	ING-INF/04	Agostino Marcello MANGINI	RTD-A ING-INF/04	supplenza retribuita	515	11/01/2019
Applications of MATLAB	3	ING-INF/04	Mariagrazia DOTOLI	Professore associato ING-INF/04	supplenza retribuita	886	17/01/2019
Multi-energy and configuration of microgrids: planning, management and control	3	ING-IND/33	Maria DICORATO	Professore associato ING-IND/33	supplenza retribuita	801	16/01/2019
Research Methodologies	3	ING-IND/31	Leonarda CARNIMEO	Professore associato ING-IND/31	supplenza retribuita	573	14/01/2019
Management and control approaches for flexible and efficient smart grids	3	ING-INF/04	Raffaele CARLI	Assegnista di ricerca	contratto	887	17/01/2019
Numerical methods for fractional calculus and matrix functions	3	MAT/08	Roberto GARRAPPA	Professore associato UNIBA MAT/08	supplenza retribuita	920 (PEC)	18/01/2019
Themes and methods of contemporary architectural research	3	ICAR/14	Francesco DEFILIPPIS	Professore associato ICAR/14	supplenza retribuita	983 (PEC)	18/01/2019
La ricerca storica e lo studio dell'antico	3	ICAR/18;					

		L-ANT/07					
Historical research and study of the city and contemporary architecture	3	ICAR/18	Antonio LABALESTRA	Architetto - dottore di ricerca	contratto	867	17/01/2019
Analysis and representation techniques for architectural research	3	ICAR/17	Gabriele ROSSI	Professore associato ICAR/17	supplenza retribuita con devoluzione al Dipartimento	844	17/01/2019
L'architettura delle forme strutturali	3	ICAR/12					

Il Direttore comunica che per l'insegnamento di "Climate Change: Impacts & Responses. How vegetation causes an alteration of hydrological conditions and spreading process in natural flows (ICAR/01)" è pervenuta la rinuncia del prof. Mossa.

Il Direttore comunica che per l'insegnamento di "How to build an ontology that lasts (ICAR/20)" è pervenuta la rinuncia del prof. Scioscia.

Il Direttore comunica che per l'insegnamento di "Reasoning on the web of data (ING-INF/05)" è pervenuta la rinuncia del prof. Scioscia.

Il Consiglio passa ad esaminare tutti gli insegnamenti per cui risulta presente una singola domanda compresi l'insegnamento di "Climate Change: Impacts & Responses. How vegetation causes an alteration of hydrological conditions and spreading process in natural flows (ICAR/01)", per cui rimane l'unica domanda della prof. De Padova; l'insegnamento di "How to build an ontology that lasts", per cui rimane l'unica domanda del prof. Borgo; e l'insegnamento di "Reasoning on the web of data", per cui rimane l'unica domanda della prof.ssa Colucci.

Tutte le domande risultano regolari e vengono considerate valide. La commissione procede ad un'attenta analisi dei curriculum dei candidati.

Tutti i candidati risultano idonei a ricoprire gli incarichi richiesti; il Consiglio, pertanto, delibera all'unanimità di assegnare a ciascuno di loro l'incarico di docenza per cui ha presentato domanda secondo la modalità (titolo gratuito o titolo retribuito) indicata nella domanda stessa, per un numero complessivo di 23 insegnamenti.

Per gli insegnamenti di "La ricerca storica e lo studio dell'antico (ICAR 18 – L-ANT/07)" e "L'architettura delle forme strutturali (ICAR 12)" non è pervenuta alcuna domanda. Pertanto, il Consiglio delibera che venga emanato un nuovo bando per l'attribuzione di questi insegnamenti.

Il Consiglio, infine, chiede che venga al più presto pubblicato il bando per l'assegnazione degli insegnamenti previsti per l'A. A. 2019-2020, già approvati nella riunione del Consiglio del 27 novembre 2018, per poter predisporre il calendario delle lezioni con congruo anticipo. Il Consiglio

da mandato al Direttore di collezionare i programmi mancanti per alcuni degli insegnamenti prima di procedere al bando. L'elenco dei 25 insegnamenti previsti, da attivare non prima di novembre 2019, è riportato nel seguito:

1. How to write a technical paper and to present it effectively to an educated audience

CFU 3 (30 ore); L-LIN/12

The course will provide a review of English grammar and the essentials of good writing. It will describe what belongs to the Abstract, the Introduction, the Method, the Results, the Discussion, Future work, Acknowledgments and References. The course will also cover selected topics on the science of scientific writing and of the textbook "Academic Vocabulary in Use" (Cambridge University Press). Moreover, the course will provide the basic rules for preparing a clear and effective Power Point presentation. Finally, each student will submit (a part of) a paper to the attention of the class for collegiate analysis and discussion, so as to render it more effective and pleasant to read; and will present it to the class using power-point, so as to become an interesting and appealing speaker.

2. Fundamentals of surface roughness analysis for tribology

CFU 3 (30 ore); SSD: ING-IND/13

1. Introduction to probability
 - 1.1. Random variables and countable sets
 - 1.2. Events and probability
 - 1.3. Dependence, independence, and conditional probability
2. Introduction to the surface roughness as a stochastic process
 - 2.1. Stationary and non-stationary processes
 - 2.2. Ergodicity of real rough surfaces
3. Probability density function (PDF) in surface roughness analysis
 - 3.1. Amplitude Probability Distribution and Density Functions
 - 3.2. Surface height distribution functions
 - 3.3. Probability Distribution and Statistics of the Asperities and Valleys
4. Correlation function and correlation length in stochastic processes
5. Spectral analysis of rough surfaces
 - 5.1. Fourier Transform and Power spectral density (PSD)
 - 5.2. Momentum of the PSD and statistical parameters of rough surfaces
6. Introduction to statistics for contact mechanics
 - 6.1. Multi-asperity theories
 - 6.2. Persson's theory

3. Optical measurements in fluid dynamics

CFU 3 (30 ore); SSD: ING-IND/12

- a) Laser doppler velocimetry (1,25 cfu)
 - i) Different optical models for LDA
 - (1) Reference beam system

- (2) Fringe model
 - ii) Signal processing
 - iii) Potential of LDA
 - iv) Multi directional measurements
 - v) Direction sensing
 - vi) Measurements of large velocity fluctuation
 - vii) Application to flow measurements
 - viii) Alternative Laser Velocimetry techniques
- b) Particle Image Velocymetry (PIV) (1 cfu)
 - i) Principle of the technique
 - ii) Image recording
 - iii) Image processing
 - iv) Solving directional ambiguity
 - v) 3D techniques
 - vi) Examples of applications
- c) Laboratory activities (0,5 cfu)

4. Residual stress evaluation by X-ray diffractometry
CFU 2 (20 ore); SSD: ING-IND/14

1. Introduction
2. Principles
3. Measurement of Lattice Strain
4. Analysis of Regular $d\phi\psi$ vs. $\sin^2 \psi$
5. Calculation of the stress
6. Effect of the Sample microstructure
7. Apparatus
8. XRD Depth Profiling Using Successive Material Removal
9. Measurement Procedure
10. Examples and practical consideration
11. Laboratory

5. Advanced opto-acoustics methods for experimental mechanics
CFU 2 (20 ore); SSD: ING-IND/14

The aim of the course is to provide knowledge and competencies in applying advanced both optical and/or acoustic techniques for an innovative approach to mechanical characterize materials in the experimental mechanics. The course will be split in two branches referring to the two methodologies in object.

Ten hours will be devoted to the optical approach: 6 for theory and 4 for laboratories. They will focus on the main characteristics of the geometrical optics and its properties according to the Fraunhofer's approximation, an overview on lens distortions and calibration methods, and the application for the correlation of the images: 2D, 3D and volumetric. During the laboratory the students will experience a real measurement for evaluating the displacement field of a component by using the Digital Image Correlation equipment.

Ten hours will be devoted to the acoustic approach: 6 for theory and 4 for laboratories. They will focus on the origin of acoustic emissions in materials, the main features of stress waves produced by materials, description of the equipment for acoustic emission, and the analysis techniques of acoustic emissions. During the laboratory the students will experience a real evaluation of the wave sound speed for different materials and on the proper location of defects.

6. Collective and swarm intelligence

CFU 3 (30 ore); SSD: ING-IND/35

- Origin and definition
- Building blocks
- Drivers
- The effect of distrust on the emergence of collective intelligence
- Statistical physics of decision making
- Discrete and continuous models
- Phase Transition, Criticality and the Emergence of Swarm intelligence

7. Design of experiment for research and process optimization

CFU 3 (30 ore); SSD: ING-IND/16

This course covers the statistical design of experiments for systematically examining systems function. Topics covered will include: refresh of basic principles of Statistical inference, introduction to experiments, completely randomized designs, blocking designs, full factorial designs with two levels, fractional designs with two levels and response surface designs.

The goal of the course is to transmit to students the basic skill to design and conduct experiments, as well as to optimize engineering system through analysis and interpretation of experimental data.

8. Theory and applications of stochastic processes

CFU 3 (30 ore); SSD: ING-INF/03

- Review of probability (2 hours)
- Poisson Processes (4 hours)
- Finite State Markov Chains (4 hours)
- Countable State Markov Chains (2 hours)
- Continuous Time Markov Chains (4 hours)
- Introduction to queueing and queueing network theory (4 hours)
- Selected Applications (4 hours)

9. Emerging methodologies and technologies for the Cyber Security

CFU 3 (30 ore); SSD: ING-INF/03

- Perimeter Security
 - Secure network architectures, De-Militarized Zone (DMZ), Bastion host
 - Network-layer and application-layer firewalls, Next Generation Firewall (NGFW)
 - Intrusion Detection Systems and Intrusion Prevention Systems
- Emerging encryption, authorization, and authentication mechanisms
 - OAuth 2.0 framework
 - Access control mechanisms based on IBAC, RBAC, and ABAC
 - Attribute Based Encryption (ABE) and its extensions
 - Suitable mechanisms for distributed and multi-authority environments (i.e., symbIoTe security framework, DMA-CP-ABE)
- Security approaches for Cyber-Physical Systems (CPS) and cloud-based CPS
 - Lightweight cryptography and key management scheme for the Internet of Things
 - Elliptic Curve Qu-Vanstone (ECQV) algorithm and Implicit X.509 certificates
 - Blockchain technology, applications, and emerging platforms
- Experimental configuration of advanced security solutions
 - Defined in agreement with interested students

10. Supervision and monitoring of renewable energy systems
CFU 3 (30 ore); SSD: ING-IND/31

The course aims to introduce the fundamental concepts for the monitoring of the electrical and energy performance of plants/systems based on Renewable Energy Sources (RES), notably photovoltaic systems, and for the diagnostics of anomalies or failures. The first part will be based on the statistical methods applied to the usually available data, the second one will be based on the non-destructive diagnostic techniques, in particular on the infrared analysis.

11. Lab-on-chip devices
CFU 3 (30 ore); SSD: ING-INF/01

- General introduction to Lab-on-chip devices.
- Overview of biochemical assays and sequencing techniques.
- Introduction to microfluidics.
- Materials and fabrication techniques for integrated microsystems.
- Electrochemical and photonic techniques for detection
- LoC Applications.

12. Matlab Recipes for Measurement Data Processing
CFU 3 (30 ore); SSD: ING-INF/07

In accordance with the principles stated in the summary, the programme is subject to be adjusted. Below is a list of possible topics of interest

- Introduction: TOMFL (Test of Matlab as a Foreign Language)
- Fundamentals and applications of linear and nonlinear Least Squares Method.
- Repeatability and uncertainty of measurements.
- How good is my data acquisition hardware? Measuring ENOB, integral and differential nonlinearity, amplitude noise, time noise.
- Advanced use of my arbitrary function generator: synthesizing and using a “good” test signal.

13. Design and optimization of nearly Zero Energy Buildings and Districts
CFU 3 (30 ore); SSD: ING-IND/33

Introduction

Technologies for Zero Energy Buildings and Districts

Modelling principal components

Development of tools for optimal operation of ZEB/ZED

Representation of most common distribution grids: electrical, natural gas and water

Optimization of energy resources in the presence of grid constraints

Development of tool for optimal design of ZEB/ZED

14. Middleware and architecture for Industry 4.0
CFU 3 (30 ore); SSD: ING-INF/05

The program will cover the following topics:

- Industrial Internet: the Industrial Internet of Things
- The Internet technology into production process
- Industrial IoT (IIoT) Reference Architecture
- Middleware Software Patterns
- Software Design Concepts
- Middleware Industrial Internet of Things Platforms
- IoT in the production process: connecting machines, products and systems
- Events and Streaming: Complex Event processing

Products and services: open standards and solutions

15. Modeling of Smart Material Systems
CFU 3 (30 ore); SSD: ING-INF/04

- Introduction to smart materials in mechatronics
- Modeling of thermal shape memory alloys
- Modeling of piezoelectric ceramics
- Modeling of magnetic shape memory alloys
- Modeling of dielectric elastomer
- Computer-aided simulation and design of smart material actuator and sensor systems in Matlab/Simulink environment

16. Software-Based Methods for Modern Control Systems Design
CFU 3 (30 ore); SSD: ING-INF/04

- Introduction to modern control systems
- Multi-physics modeling of systems from different domains: mechanical, electrical, fluidic, thermal, chemical
- Control methods based on time domain
- Control of multi-input multi-output systems
- Control of uncertain systems
- Computer-aided design of modern control systems in Matlab/Simulink environment

17. Adaptive technologies for the Mitigation of Urban Heat Island and Climate Change Effects

CFU 3 (30 ore); SSD: ICAR/10

The first part of the course will explore in details the major issues of urban climatology, helping in defining the interaction between environmental variables, outdoor surfaces and building fabrics. In the second part of the course detailed students will investigate in detail adaptive technologies to mitigate the temperature effects of climate change-related phenomena. Examples from successful real case studies will be shown. Finally, the third part of the course will provide students with a hands-on experience of modelling techniques and tools to simulate the thermal characteristics of cities and buildings and assess the impact of adaptation technologies. The assessment will be based on the modelling of a selected case study and on the analysis of the effects of different adaptation technologies.

18. Advanced numerical modelling and nonlinear analysis of existing buildings under seismic actions

CFU 3 (30 ore); SSD: ICAR/09

1. Introduction to advanced computational and numerical methods for the nonlinear structural analysis. The basics elements and references for the Fem analysis will be provided, and additionally an overview about alternative computational approaches will be given: Finite Element Methods, Distinct Element Methods, Rigid Body and Spring Methods. The course will be then specifically focused about the modelling and analysis in the nonlinear dynamic field, time-history analysis; issues and approaches in the selection of the seismic input; use of nonlinear static approaches, with specific regard to multi-modal and adaptive pushover analysis.

2. Methods and strategies for the structural and seismic analysis of existing buildings accounting for structural and nonstructural elements

The modelling; and analysis peculiarities of existing buildings will be provided, with a focus on the influence of nonstructural elements on the structural response and on the possible strategies and computational approaches to be used,

3. Presentation of real case studies with the use of specialized software.

The course will provide a short exercise developed by the PhD student on a theme chosen according to his/her specific interests of research

Motivation. This the course represents a fundamental basis for all doctoral students dealing with complex engineering problems, in the spirit of the program of the Ph.D. in Risk and Environmental, Territorial and Building Development, but involves also a number of interdisciplinary themes interesting in other engineering fields, such as, for example: development, design and testing of mechanical devices for passive and active seismic protection; processing of signals to be used as an input; treatment of large dataset data deriving from numerical vulnerability analyses.

19. Lab-and-field data acquisition and processes in Hydraulics

CFU 3 (30 ore); SSD: ICAR/01

The following topics are studied, combining theory and practical examples.

Measurement definition and concept. Measurement instrumentation and sensors. Sources of error. Measurement uncertainty.

Measurement in static and dynamic conditions.

Instrument calibration. How to get a calibration curve from laboratory data.

Sensitivity, accuracy and precision. Measurement range and frequency response. Instrument precision. Measurement error. Theory of errors.

How to carry out a measurement. Nyquist theorem. Sampling duration.

Signal analysis in time and frequency domain. FFT and IFFT. How to obtain a spectrum of the measured signal with FFT technique.

Acquisition signal chain. Control and management of remote measuring stations, with sensors sampling hydrodynamic parameters.

Acoustic and laser signal sources. Doppler effect. Measuring flow velocity with LDA and ADV sensors.

20. Multidisciplinary approach to solving complex environmental problems

CFU 2 (20 ore); SSD: ING-IND/22, ICAR/03 and ICAR/02

The following issues will be addressed: (i) Use of renewable energies for wastewater treatment and reuse in agriculture; (ii) Remediation of contaminated soil, the case study of the "Terra dei fuochi" in the Campania Region; (iii) Assessment of public perception in support to social acceptance of technological solutions: the case study of actions concerning the water and solid waste minimization implemented in the island of Favignana (Egadi Islands, Sicily);

(iv) Siting of the municipal solid waste treatment and disposal facilities in the context of industrialized countries.

21. Teorie e metodi del progetto per l'antico

CFU 3 (30 ore); SSD: ICAR/14

22. Teorie della ricerca architettonica contemporanea

CFU 3 (30 ore); SSD: ICAR/14

23. Teorie e metodi del progetto per la città

CFU 3 (30 ore); SSD: ICAR/14

24. Teorie e metodi del progetto per il territorio

CFU 3 (30 ore); SSD: ICAR/21

25. Teorie e metodi del progetto per le strutture: modellazione e sperimentazione

CFU 3 (30 ore); SSD: ICAR/08-09

P.3) Corsi aggiuntivi per il XXXIV ciclo.

Al Direttore sono pervenute attraverso il Coordinatore del dottorato di ricerca in Ingegneria Elettronica e Informatica, prof. Grieco, quattro richieste di riconoscimento di corsi di terzo livello da 3 CFU ciascuno nell'ambito dell'offerta formativa della Scuola di dottorato:

- 1) Antenna technology for 5G Communications: propagation, arrays and integration
CFU 3 (30 ore); SSD: ING-INF/02

-Introduction;

-Antenna elements and types: smart and reconfigurable configurations; -Implementation of

antenna arrays using basic principles;
-Characterization and test of antenna and array performance;
-Radiopropagation, beam steering and beam forming for communication systems.

2) Green photonics
CFU 3 (30 ore); SSD: ING-INF/02

Photonics for a sustainable economy – Introduction Sustainable energy generation: nanostructures for photovoltaics. Reduced energy consumption: active photonics devices. Enabled eco-friendly design and production by means of laser technology. Material savings by laser cutting Control of production processes Reduced risk potential by sensor networks Environmental monitoring.

3) Blockchain And Distributed Ledger Technologies
CFU 3 (30 ore); SSD: ING-INF/05

* Blockchain e Distributed Ledger Technologies (DLT): elementi di base, richiami di elementi di reti peer-to-peer e di crittografia, classificazione di piattaforme DLT, ambiti applicativi. [4 ore] * Strutture dati per DLT: hash tree, Merkle tree. [2 ore] * Algoritmi di consenso per DLT: Byzantine Fault Tolerance, Proof of Work, Proof of Stake, Proof of Authority, Proof of Elapsed Time. [4 ore] * Smart contract: elementi di base, macchine virtuali distribuite, linguaggi imperativi e dichiarativi per smart contract. [2 ore] * Bitcoin: elementi di base sulle criptovalute, caratteristiche generali della piattaforma Bitcoin, il linguaggio Script, configurazione di un nodo Bitcoin [4 ore] * Ethereum: Ethereum token, lo standard ERC20; Ethereum come piattaforma per applicazioni distribuite, il linguaggio Solidity. [6 ore] * Hyperledger: architettura della piattaforma; i framework Hyperledger Fabric, Iroha e Sawtooth; tool per l'esplorazione di dati su DLT (Hyperledger Explorer), soluzioni DLT-as-a-Service (Hyperledger Cello); Hyperledger Composer Modeling Language. [8 ore]

4) Advanced research for microgrids control
CFU 3 (30 ore); SSD: ING-IND/33


1. Motivations behind the evolution of distribution networks from passive to active giving rise to the so called “smart-microgrids”.
2. Generalities about microgrids, including general structure and different topologies.
3. Analysis of the technologies that should be added to a microgrid to make it smart.
4. Methods and strategies for selecting the most appropriate SCADA system architecture depending on the application. Analysis of the existing SCADA architectures.
5. Analysis of the different operating states of a microgrid and introduction to the main problems related to each of them.
6. Methods and control strategies for ensuring the optimal management and secure operation of these systems in the all possible operating states.
7. Analysis of the main impacts that may be caused by the microgrid control strategies on distribution network operation.
8. Presentation of a real-case

Il Consiglio della Scuola di dottorato approva il riconoscimento dei quattro corsi nell'ambito dell'offerta formativa della Scuola di dottorato per il XXXIV ciclo e delibera di bandire i corsi

insieme agli altri due per cui non è pervenuta alcuna domanda.

La seduta si scioglie alle 17,15. Del che è redatto il presente verbale, che viene letto e approvato seduta stante.

Il Direttore
prof. ing. Pietro De Palma



Il Segretario
prof. Ing. Alfredo Grieco


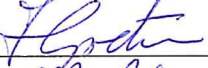
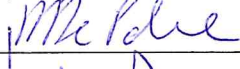


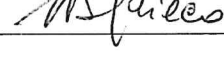


**VERBALE DEL CONSIGLIO
DELLA SCUOLA DI DOTTORATO DEL POLITECNICO DI BARI**

FOGLIO DELLE FIRME

Seduta n. 1/2019

del giorno 31 gennaio 2019

	PROF			Firma	Assente giustific.	Assente
1	PROF.	ALBINO	Vito			
2	PROF.	CUPERTINO	Francesco			
3	PROF.	DE PALMA	Pietro			
4	PROF.	DEMELIO	Giuseppe Pompeo			
5	PROF.	GIGLIETTO	Nicola		AG	
6	PROF.	MASTRORILLI	Pietro		AG	
7	PROF.	MENGHINI	Anna Bruna		AG	
8	PROF.	MOCCIA	Carlo		AG	
9	PROF.	MOSSA	Michele			
10	PROF.	GRIECO	Alfredo			
11	DOTT.	MOTTA ZANIN	Giulia		AG	

