Edoardo Fiorucci

Programme of "Collaudi di macchine e impianti elettrici" ***"Measurements and Test of Electrical Machines and Systems"***		
Number of ECTS credits: 9 (workload is 225 hours; 1 credit = 25 hours)		
I0283, Compulsory **2st Cycle in ELECTRICAL ENGINEERING, 1st year , 2nd semester** Teacher: **Edoardo Fiorucci**		
1	**Course objectives and Learning outcomes**	The goal of this course is to acquire specific expertise in the field of measurements, testing and verifications on electrical power systems, for the experimental characterization of electrical machines and installations. On successful completion of this course, the student should be able to perform tests and measurements according to the international standards, for application in industrial and research fields.
2	**Dublin descriptors**	Topics of the course include: **Measurement techniques and instrumentation for inspections and testing on electrical installations**: visual inspection of electrical installations, grounding resistance measurement, step voltage and contact voltage measurement, fault loop impedance measurement; insulation resistance measurement, lighting systems verification, photovoltaic systems performance measurement, IEC, CEI and UNI standards. **Techniques and instrumentation for electrical power measurements on polyphase systems:** definitions of power parameters in sinusoidal and distorted conditions; power meters, voltage and current transducers, IEEE and IEC standards. **Testing of electrical machines:** experimental characterization and testing of power voltage transformers, induction motors, synchronous generators, DC machines, frequency characterization of windings, efficiency measurements, measurement of moment of inertia, IEEE and IEC standards. **Insulation measurements:** high voltage transformers, impulse voltage generators, voltage dividers and measurement instrumentation, insulating oil testing, IEEE and IEC standards. **Power quality measurements:** techniques and instrumentation for the measurement of voltage and current harmonic content and waveforms distortion, transient phenomena, light flicker, voltage unbalance, frequency variations, IEEE and IEC standards. **Electrical energy measurements**: energy counters, measuring instruments directive MID, IEEE and IEC standards. On successful completion of this module, the student should - have profound **knowledge** of measurement techniques for electrical machines and electrical installations, - **have knowledge and understanding** of the testing procedure and of international standards concerning electrical machines and electrical installations, - **understand and explain** the procedures for the implementation of testing setups - **understand** the fundamentals of international standards concerning the measurements and instrumentation - **demonstrate skill** in elaborating experimental results and **ability** to draw up a technical report, - demonstrate **capacity** for reading and understand other texts on related topics.
3	**Prerequisites and learning activities**	The student must know notions taught in the courses of Electrical Machines, Electrical Power Systems and Electrical Measurements in the 1st Cycle of Industrial Engineering.
4	**Teaching methods and language**	Lectures and laboratory exercises. Language: Italian **Ref. Text books** Giuseppe Zingales: ***Misure Elettriche*** – Utet 1992 Giuseppe Zingales: ***Misure sulle Macchine e sugli Impianti Elettrici*** – Cleup 1977

		Massimo D'Apuzzo, Nello Polese: ***Sistemi e Metodi di Misura per Applicazioni ndustriali*** – Vol. 1 e2 – Centro Stampa Opera Universitaria Napoli 1988 Giovanni Quinci – ***Manuale di Collaudi di Impianti Elettrici*** – DEI Multimedia 2002 Pippo Sergio Mistretta: ***Principi di Ingegneria Forense*** - Dario Flacco Editore 2011
5	**Assessment methods**	Oral exam.