

PAOLETTI ALFONSO

Programme of “Gestione Industriale della Qualità” “Industrial Quality Management”		
Number of ECTS credits: 9 (workload of 90 hours of teaching + work at home)		
CODE : I2G003 TYPE OF COURSE UNIT : Compulsory for 2nd Cycle in MANAGEMENT ENGINEERING, 1st year , 1st semester. Teacher: Alfonso Paoletti		
1	Course objectives and Learning outcomes	<p>The goal of this course is to provide the motivations, definitions and techniques for the analysis of basic concepts of quality control, to provide the basis for the use of the tools of statistical process control, to illustrate the systems of industrial quality management, in order to improve quality and uniformity of products.</p> <p>On successful completion of this module, the student should understand the fundamental concepts of quality control, quality assurance and quality management.</p>
2	Dublin descriptors	<p>Topics of the module include:</p> <p>Introduction: concepts and definitions of quality, value and cost of quality, the principles of total quality, the seven tools of quality management, the Deming cycle.</p> <p>Quality management systems: regulatory aspects of quality management, certification according to ISO 9000 Standards, the quality manual, certification institutions, accreditation institutions.</p> <p>Statistical Process Control: variability of the characteristics of the product/service, quality and variability, the seven statistical tools of quality control, sampling control, sampling criteria, variables control charts, attributes control charts, process capability indexes, six-sigma method, statistical decisions, hypothesis tests, confidence intervals, chi-square test, one-way analysis of variance.</p> <p>Acceptance sampling: single-sampling plans, double-sampling plans, multiple-sampling plans, sequential-sampling plans, the operating characteristic curves, standards for the definition of sampling plans.</p> <p>Design and improvement of the production process through statistical programming of experiments: the design of experiments, two-way analysis of variance, randomization in designed experiments, full and fractional factorial experiments, center points in a factorial design, response surface methodology, process optimization.</p> <p>On successful completion of this module, the student should</p> <ul style="list-style-type: none"> - have profound knowledge of basic techniques in statistical process control, - have knowledge and understanding of certification process of an organization, - understand and explain the meaning of quality control, quality assurance and quality management, - understand the fundamental concepts of statistical process control, acceptance sampling, design of experiments and their connections and be aware of potential applications in other fields, - demonstrate skill reasoning in quality management systems, statistical process control, acceptance sampling, design of experiments and ability to conceive a quality management system, - demonstrate capacity for reading and understand other texts on related topics.
3	Prerequisites and learning activities	The student must know the basic notions of Probability and Statistics.
4	Teaching methods and language	<p>Lectures and exercises. Language: Italian</p> <p>Ref. Text books</p> <ul style="list-style-type: none"> - Douglas C. Montgomery: Statistical Quality Control, John Wiley & Sons, 2009. - A. V. Feigenbaum: Total Quality Control, 3rd Ed., 1991, McGraw Hill. - P.L. Jain: Quality Control and Total Quality Management, McGraw Hill, 2001. - ISO Standards on Quality Management Systems.
5	Assessment methods	Written and oral exam.