



**UNIVERSITÀ
DEL SALENTO**

CORSO DI LAUREA LM54 -

**CdLM Management Engineering
SCHEDE INSEGNAMENTI DIDATTICA PROGRAMMATA
a.a. 2020/2021**



SCHEDA INSEGNAMENTO

DATA MANAGEMENT

Corso di studio di riferimento	LM54 - CdL Magistrale in Management Engineering
Dipartimento di riferimento	Dipartimento di Ingegneria dell'Innovazione
Settore Scientifico Disciplinare	ING-INF/05
Docente	Antonella LONGO
Crediti Formativi Universitari	9
Ore di attività frontale	81
Ore di studio individuale	144
Anno di corso	I anno
Semestre	I
Lingua di erogazione	Inglese
Percorso	PERCORSO COMUNE

Prerequisiti	No previous skills are required. The use of computer and the tools of office automation are welcome
Contenuti	This is a course in information systems and data modelling; it is aimed at providing principles and tools to model data in information systems. It is a necessary prerequisite for more advanced courses in the management of digital technologies in enterprises and in the study of business intelligence. Students acquire a better understanding of relational and analytical database system structures and learn structured query language. These skills prepare them to, design and develop relational and multidimensional databases, fundamental elements of Enterprise Information Systems.
Obiettivi formativi	<p>Knowledge and understanding. Students must have a solid background related to the basics of data management and information systems:</p> <ul style="list-style-type: none">- They must have the basis to think analytically, creatively and critically and being able to create abstraction and problem solving skills to cope with complex systems- They must have a basic knowledge of design and implementation of data management systems- They must have the tools to design transactional and analytical databases applied to different contexts- They must have the skills to argument data in different scenario, the tools for managing them, together with its impact. <p>Applying knowledge and understanding. After the course the student should be able to:</p> <ul style="list-style-type: none">- Describe the model and frameworks of an Information System; illustrate the main components of an information system from



	<p>the technical and application perspective and the impact of information systems on business.</p> <ul style="list-style-type: none">- Distinguish conceptual, logical and physical models in data management.- Model Online Transaction processing systems from a data perspective, distinguishing among ER models, relational models and physical models- Model Online Analytical processing systems from a data perspective, distinguishing among DFM, Snowflakes and physical models, being able to describe the relationships among them and the processes <p>Making judgements. Students are guided to critically approach the topics treated during the class, to compare different solutions to a problem, to identify and propose the most effective or efficient solution in an autonomous way.</p> <p>Communication. Students must learn to communicate with heterogeneous audiences, explaining their position, in logical, coherent and effective way. During the course students will be provided with domain specific vocabulary and the proper scientific knowledge and methods to expose and argue in precise and formal way the main topics related to data management and information system</p> <p>Learning skills. Students must acquire the critical ability to autonomously relate to the typical problems of data and information management and, in general, cultural issues related to information systems and their management. They should be able to develop an approach to independently structure knowledge and methods learnt with a view to possible continuation of studies at higher (doctoral) level or in the broader perspective of cultural and professional self-improvement of lifelong learning. Therefore, students should be able to switch their learning approach according to different learning sources and the objectives they must achieve in terms of results and audience</p>
Metodi didattici	<p>The course aims to provide students with tools and knowledge for data management in business organizations. The course consists of frontal lessons and classroom hands on exercises. The frontal lessons are aimed at improving students' knowledge and understanding through the presentation of theories, models and methods; students are invited to participate in the lesson with autonomy of judgement, by asking questions and presenting examples. The exercises are aimed at using tools which support the models and approaches presented</p>
Modalità d'esame	<p>Written and Oral</p> <p>The exam is made up of both written and oral part.</p> <p>The written part aims at evaluating to what extent the student has: 1) the ability to design data models according to methodologies presented during the call, 2) reasoning about his/her choices and the capacity to integrate different concepts and tools.</p> <p>The oral part follows the written part if the student has been scored with sufficient at least. It is aimed to verify to what extent the student has gained</p>



	knowledge and understanding of selected topics and he is able to communicate them.
Programma	<p>Introduction to Computer and Information Systems (21 hours)</p> <ul style="list-style-type: none">- Computer, digital media, automatic information processing. Computer networks. Enterprise information systems and information architectues. <p>Online Transaction Processing (30 Hours)</p> <ul style="list-style-type: none">- The aim of this module is to teach students to design database models and to implement tables, queries, forms, reports and web pages. The focus will be on why and how to use databases in some significant business scenarios. SQL and other programming languages will be presented to understand the basics of modern Web Applications and Service Oriented Architectures. <p>Online Analytical Processing (30 Hours)</p> <ul style="list-style-type: none">- The aim of this module is to present models, methodologies and tools to understand Business Intelligence. Specific attention will be put on multidimensional analysis and on how to design and implement datawarehouses.
Testi di riferimento	<ul style="list-style-type: none">- Fundamentals of Database Systems, 6th Edition, Elmasri, Navathe, Addison-Wesley- Datawarehouse Design - Modern Principles and Methodologies , Matteo Golfarelli, Stefano Rizzi, McGrawHill- Information Systems Paige Baltzan, 4th edition, Mc Graw Hill Education- Teaching materials provided at the course
Altre informazioni utili	



SCHEDA INSEGNAMENTO

Energy Management

Corso di studio di riferimento	LM54 - CdL Magistrale in Management Engineering
Dipartimento di riferimento	Dipartimento di Ingegneria dell'Innovazione
Settore Scientifico Disciplinare	ING-IND/09
Docente	Arturo De Risi
Crediti Formativi Universitari	9
Ore di attività frontale	81
Ore di studio individuale	144
Anno di corso	I anno
Semestre	I
Lingua di erogazione	Inglese
Percorso	PERCORSO COMUNE

Prerequisiti	No previous course are required
Contenuti	<ul style="list-style-type: none">• Focus on corporate issues and optimise professional skills at a managerial level• Gain in-depth knowledge and vision of energy technologies, industries and markets• Develop and implement a strategic mindset to address major future issues within the energy industry
Obiettivi formativi	Supply all the informations to: monitor and manage the energy efficiency of a facility or organization; to implement conservation measures, monitor energy consumption; to assess business decisions for sustainability;
Metodi didattici	Frontal lessons and exercises
Modalità d'esame	Frontal lessons and exercises
Programma	Energy Audit - Regulation parts 1-2-3-4 Fundamentals of thermodynamical and electrical measurements Data acquisition software and hardware Energy Diagnosis of complex systems and buildings Fundamental of HVAC systems Fundamental of Solar Renewable Energy Plant Investment analysis Economic technical analysis



Testi di riferimento	Class Notes WAYNE C. TURNER, ENERGY MANAGEMENT HANDBOOK, THE FAIRMONT PRESS, INC, Lilburn, Georgia
Altre informazioni utili	



SCHEDA INSEGNAMENTO

MANUFACTURING SCHEDULING

Corso di studio di riferimento	LM54 - CdL Magistrale in Management Engineering
Dipartimento di riferimento	Dipartimento di Ingegneria dell'Innovazione
Settore Scientifico Disciplinare	ING-IND/16
Docente	Antonio Domenico GRIECO
Crediti Formativi Universitari	6
Ore di attività frontale	54
Ore di studio individuale	96
Anno di corso	I anno
Semestre	I
Lingua di erogazione	Inglese
Percorso	PERCORSO COMUNE

Prerequisiti	Conoscenza degli elementi di base degli impianti industriali; degli elementi di base della programmazione matematica; degli elementi di base della gestione dei dati; di Excel; degli elementi di base di Tecnologia Meccanica; degli elementi di base dei Sistemi di Lavorazione e della Produzione Industriali, conosceva sistemi MRP, MPS (vedi sezione OTHER USEFUL INFORMATIONs per esempi di materiali disponibile sui motori di ricerca).
Contenuti	The course examines the basic concepts of what to produce, when to produce, how much to produce, etc. to create finished products. Throughout the course, we will discuss the capabilities of ERP and/or MRP system(s) as it applies to production planning and scheduling. In the course several industrial cases and experiences will be illustrated.
Obiettivi formativi	This course will teach you how to improve, manage, and regulate all aspects of a successful manufacturing operations infrastructure. Youll develop the ability to design and oversee an effective master production schedule that makes the best possible use of your manufacturing resources. Youll discover the basics of materials requirements planning, including considerations like lead time offsetting, bill of materials, and determining manufacturing order quantities. Youll understand how to apply the principles of capacity planning and management to determining capacity requirements and to matching capacity with materials scheduling and input/output control. Youll learn the best way to develop and implement a winning production activity control system that reduces WIP, inventories, and lead times, guarantees the correct execution of material plans, and ultimately meets all of your customer service objectives.
Metodi didattici	
Modalità d'esame	Esame scritto sia con domande di teoria che esercizi numerici.



Programma	Introduction: The Role of Scheduling, The Scheduling Function in an Enterprise. Deterministic Models. Deterministic Models: Preliminaries, Framework and Notation Examples, Classes of Schedules, Complexity Hierarchy. Single Machine Models (Deterministic), The Total Weighted Completion Time, The Maximum Lateness, The Number of Tardy Jobs , The Total Tardiness - Dynamic Programming, The Total Tardiness - An Approximation Scheme, The Total Weighted Tardiness. Advanced Single Machine Models (Deterministic), The Total Earliness and Tardiness, Primary and Secondary Objectives, Multiple Objectives: A Parametric Analysis. The Makespan with Sequence Dependent Setup Times, Job Families with Setup Times, Batch Processing. Parallel Machine Models (Deterministic): The Makespan without Preemptions, The Makespan with Preemptions, The Total Completion Time without Preemptions, The Total Completion Time with Preemptions, Due Date Related Objectives, Online Scheduling, Flow Shops and Flexible Flow Shops (Deterministic), Flow Shops with Unlimited Intermediate Storage, Flow Shops with Limited Intermediate Storage, Flexible Flow Shops with Unlimited Intermediate Storage. Job Shops (Deterministic) Disjunctive Programming and Branch-and-Bound, The Shifting Bottleneck Heuristic and the Makespan, The Shifting Bottleneck Heuristic and the Total Weighted Tardiness Constraint Programming and the Makespan. Open Shops (Deterministic) The Makespan without Preemptions, The Makespan with Preemptions, The Maximum Lateness without Preemptions, The Maximum Lateness with Preemptions, The Number of Tardy Jobs.
Testi di riferimento	Scheduling. Theory, Algorithms, and Systems. Authors: Pinedo , Michael L. Edizione dalla 2012 e successive.
Altre informazioni utili	docs.oracle.com/cd/E39583_01/fscm92pbr0/eng/fscm/smf/g/task_Examples ofProductionScheduling-9f2db7.html http://www.dia.uniroma3.it/~pacciare/CORSI/MSP/MRP.pdf http://production-scheduling.com/



SCHEDA INSEGNAMENTO

PROJECT MANAGEMENT

Corso di studio di riferimento	LM54 - CdL Magistrale in Management Engineering
Dipartimento di riferimento	Dipartimento di Ingegneria dell'Innovazione
Settore Scientifico Disciplinare	ING-IND/35
Docente	Giustina SECUNDO
Crediti Formativi Universitari	6
Ore di attività frontale	54
Ore di studio individuale	96
Anno di corso	I anno
Semestre	I
Lingua di erogazione	Inglese
Percorso	PERCORSO COMUNE

Prerequisiti	Basic knowledge about Business management and Cost accounting
Contenuti	<p>The course focuses on project management methodologies and tools. At the end of the course the student has the basic and advanced knowledge to organize, plan and control a project and to identify the development and launch strategies of a new product and service. In particular, the student knows the dynamics and critical aspects of project management, planning tools (scope statement, WBS, RAM, Gantt, Diagram, Network Diagram), tools for stakeholder and risk management, tools for controlling a project using the EVM methodology.</p> <p>The Project Management course aims to provide knowledge and competences and skills in three important aspects of project management:</p> <ul style="list-style-type: none">a) the project planning methodologies according the standard of Project Management Institute (PMI);b) the theory, methods, quantitative tools and software used to effectively plan, organize, and control projects;c) hands-on, practical project management knowledge from on-site situations and the development of a Project Management Plan as project work activities for the course. <p>The course contents relies on the standard of the Project Management body of Knowledge (PMBOK® Guide) Sixth EDITION 2017. Within the framework, students learn the methodologies and tools necessary for each aspect of the process as well as the theories upon which these are built.</p>
Obiettivi formativi	<p>At the end of the course the students should be able to:</p> <ul style="list-style-type: none">describe the 10 knowledge area of the Project management according to the Project Management body of Knowledge (PMBOK® Guide);-define the scope of a project and develop the project charter and project management plan;



	<ul style="list-style-type: none"> -use Gantt charts to present the activities of a project and Apply PERT Techniques for project planning; -apply the International Project Management Standards from the Project Management Institute (the PMBOK® Guide) to real-world situations; -apply the indicators to assess the performance of a project (EVA Earned Value Management Model); -communicate effectively and expressing arguments with preciseness, and debating findings; -develop effective writing skills through assignment reports .
Metodi didattici	<p>The course consists of frontal lessons for about 50% of the course. Lessons are interspersed with exercise sessions (about 30% of the course) for the different areas covered: the project context and organisation, project planning, project control, risk management. Exercises sessions are based on short case and applications to the assignend project work.</p> <p>Laboratory activities and team work (about 10%) are foreseen on the following topics: Project charter development, project management plan, project team management, project planning with the use of MS Project software, stakeholder management. The course requires students to carry out a group work and about 10% of the lessons will be dedicated to explaining and reviewing the work with the students.</p> <p>Seminars will be organized in collaboration with the PMI Project management Institute and held by managers, focused on the behavioral skills and methodologies needed for the management of projects in complex organizations. Not attending students are required to contact the teacher (giusy.secundo@unisalento.it) at the beginning of the course to decide together how to manage the project work activities.</p>
Modalità d'esame	<p>The final individual evaluation is based on:</p> <ul style="list-style-type: none"> - Group assignment (project work): 40% of the final mark. The project work will be related to the development of a project charter and a project management plan starting from an idea developed by students. Students must deliver a final report at the end of the course (power point presentation), and they will use of a specific sw tool for project planning. The final project work will be presented in front of a scientific committee composed by expert in the field of Project management. - Individual oral exam: (60% of the final mark) the oral exam lasting about 20 minutes based on theoretical questions in line with what was done in the Lessons in the classroom . <p>For not attending students the assessment methodologies will be the same. In this case the project work could be developed individually.</p>
Programma	<p>The course contents relies on the standard of the Project Management body of Knowledge (PMBOK® Guide) sixth EDITION 2017. Within the framework, students learn the methodologies and tools necessary for each aspect of the process as well as the theories upon which these are built.</p>



	<p>Introduction to Project Management (13 hours): Introduction to the Project Management Course, the importance of project, the project and the organisation, project manager role and competence, project life cycle, Project management Canvas (9 hours): The project management canvas as a framework to design, manage, implement and control a project (. PM canvas pillars: project context, project infrastructure (resources and budget); System (coordination); project's impact (value); Life Cycle (Activities and time) The Project Management Knowledge Area (PMBOK® Guide) (32 hours). The Knowledge areas and Process of Project Management; Project Integration Management, Project Scope Management; Project Time Management; Project Cost Management; Project Quality Management; Project Stakeholder Management; Project Risk Management; Project Procurement Management; Project Communication Management; Project Human Resource Management.</p>
Testi di riferimento	<p>Alessandro Margherita, Gianluca Elia, Giustina Secundo (2018) "Building a Project Mindset: A Canvas for Managing Project Complexity" Franco Angeli. Project Management Institute "A Guide to Project Management body of Knowledge (PMBOK® Guide)" Sixth EDITION, 2017. Guido Capaldo, Antonello Volpe (2012) Project Management - Principi, metodi e applicazioni al settore delle opere civili. McGrawHill</p>
Altre informazioni utili	<p>For any further information, please contact the teacher at giusy.secundo@unisalento.it</p>



SCHEDA INSEGNAMENTO

BUSINESS ANALYTICS

Corso di studio di riferimento	LM54 - CdL Magistrale in Management Engineering
Dipartimento di riferimento	Dipartimento di Ingegneria dell'Innovazione
Settore Scientifico Disciplinare	MAT/09
Docente	Gianpaolo GHIANI
Crediti Formativi Universitari	9
Ore di attività frontale	81
Ore di studio individuale	144
Anno di corso	I anno
Semestre	II
Lingua di erogazione	Inglese
Percorso	PERCORSO COMUNE

Prerequisiti	Calculus. Probability and Statistics. Linear Algebra.
Contenuti	This course addresses the principles and practice of Business Analytics (BA), with an emphasis on applications to logistics, transportation and supply chain management.
Obiettivi formativi	<p>Knowledge and understanding . The course introduces the student to the use of analytics in the business world.</p> <ul style="list-style-type: none">- Students will acquire the basic cognitive tools to think analytically, creatively, critically and in an inquiring way, and have the abstraction and problem-solving skills needed to cope with complex business problems.- They will have solid knowledge of BA methodologies.- They will be able to use analytics to improve decision-making processes. <p>Applying knowledge and understanding. After the course the student should be able to:</p> <ul style="list-style-type: none">- describe and use the main BA techniques;- understand the differences among several algorithms solving the same problem and recognize which one is better under different conditions;- explain experimental results to business people. <p>Making judgements . Students must have the ability to use BA techniques and must arrive at original and autonomous ideas and judgments.. The course promotes the development of independent judgment in the appropriate choice of techniques/models and the</p>



	<p>critical ability to interpret the goodness of the results of the chosen models/methods.</p> <p>Communication. It is essential that students are able to communicate with a varied and composite audience, not culturally homogeneous, in a clear, logical and effective way, using the methodological tools acquired and their scientific knowledge and, in particular, the specialty vocabulary. Students should be able to organize effective dissemination and study material through the most PERCORSO COMUNE presentation tools, including computer-based ones, to communicate the results of data analysis processes, for example by using visualization and reporting tools aimed at different types of audiences.</p> <p>Learning skills. Students must acquire the critical ability to relate, with originality and autonomy, to the typical problems of data mining and, in general, cultural issues related to other similar areas. They should be able to develop and apply independently the knowledge and methods learnt with a view to possible continuation of studies at higher (doctoral) level or in the broader perspective of cultural and professional self-improvement of lifelong learning. Therefore, students should be able to switch to exhibition forms other than the source texts in order to memorize, summarize for themselves and for others, and disseminate scientific knowledge.</p>
Metodi didattici	The course consists of lectures, classroom exercises and home assignments. Lectures aim at providing the methodological foundations. They are given using slides and/or a blackboard. Students are invited to participate by asking questions and presenting examples. The exercises and home assignments are about the solution of practical problems with software tools.
Modalità d'esame	The exam consists of two parts: <ul style="list-style-type: none">- a written test made up of 10 questions [10 marks];- an oral exam in which students must:<ul style="list-style-type: none">- discuss a presentation of their own on an advanced course topic [10 marks];- show their ability to use the software tools presented in the course (Python libraries for machine learning, AMPL, ...) [10 marks].
Programma	<p>PART I INTRODUCTION (5 hours) 1.1 Introducing BI (5 hours)</p> <p>PART II PROGRAMMING SKILLS (8 hours) 2.1 Getting started in Python (8 hours)</p> <p>PART III DESCRIPTIVE ANALYTICS (10 hours) 3.1 Making sense of data, visualizing and exploring data (1 hour) 3.2 Descriptive stastical measure (9 hours)</p> <p>PART IV PREDICTIVE ANALYTICS (32 hours)</p>



	<p>4.1 Forecasting: basics (2 hours) 4.2 Extrapolating time-series (8 hours) 4.3 Regression models (4 hours) 4.4 Basics of classification models (2 hours) 4.5 Performance evaluation with analytical methods: queueing models (6 hours) 4.6 Performance evaluation with discrete event simulation: basics, random number generation, output analysis, SIMIO tutorial (10 hours)</p> <p>PART V PRESCRIPTIVE ANALYTICS (26 hour) 5.1. Optimization model review, AMPL (8 hours) 5.2 Applications to logistics, manufacturing and transportation (18 hours)</p>
Testi di riferimento	<p>Handouts (available on FormazioneOnLine. For consultation:</p> <ul style="list-style-type: none">- Evans, James Robert. Business analytics: Methods, models, and decisions. Vol. 3. Upper Saddle River, NJ: Pearson, 2013.- Ghiani, Gianpaolo, Gilbert Laporte, and Roberto Musmanno. Introduction to logistics systems management. John Wiley Sons, 2013.
Altre informazioni utili	<p>Office Hours By appointment. As a rule, on Tuesdays at 11:00 in my office or on Skype (nickname: gianpaolo_ghiani). Please contact the instructor by email or at the end of the lectures.</p>



SCHEDA INSEGNAMENTO

BUSINESS INTEGRATED MANAGEMENT

Corso di studio di riferimento	LM54 - CdL Magistrale in Management Engineering
Dipartimento di riferimento	Dipartimento di Ingegneria dell'Innovazione
Settore Scientifico Disciplinare	ING-IND/35
Docente	Angelo Corallo
Crediti Formativi Universitari	12
Ore di attività frontale	108
Ore di studio individuale	192
Anno di corso	I anno
Semestre	II
Lingua di erogazione	Inglese
Percorso	PERCORSO COMUNE

Prerequisiti	No Prerequisite
Contenuti	<p>The course is designed to provide a perspective lens to review/design the entire enterprise architecture according to the concept of business model, as a key element to connect the strategy to the organization and to processes. The proposed model, inspired by the emerging interdisciplinary approaches in business schools, considers the issue of value creation in organizations as the main focus of interest. Each of the company's dimensions - strategic, organisational, process and technological - is analysed both with regard to the specific models and tools that allow detailed planning and through an holistic interconnection logic that uses the Business Model as an approach to representation.</p>
Obiettivi formativi	<p>The course aims to provide an integrative approach to the analysis of the environment inside and outside the company, to the understanding of the key factors of competitive advantage, to the study of strategic components, to the models and tools for operations. Knowledge and understanding. The student must have a solid background with a broad spectrum of basic knowledge related to the understanding and optimization of business processes according to an integrated approach to business management. In particular, the student must:</p> <ul style="list-style-type: none">- have the basic cognitive tools to think analytically, creatively, critically and have the ability to abstract and solve problems within complex systems;- have a thorough knowledge of the concept of the business model and of the key variables for the definition of the strategy and for the management of the business;



- have a solid knowledge of the existing networks and the network logic on which the collaboration relationships between companies;
 - know how to analyse the theoretical and practical foundations of Business Process Management in order to understand the functioning of companies in terms of tasks, events, organizational roles and decision-making;
 - have a critical and detailed knowledge of the theoretical foundations, methodologies and techniques for the design of organisational structures and mechanisms;
 - have a good knowledge of new Information and Communication Technologies in order to enable the digitisation of businesses;
 - possess the fundamental conceptual tools for the definition of an enterprise architecture to harmonize business processes, business strategies and technological solutions.
- Applying knowledge and understanding. The student must demonstrate the ability to apply, independently and critically, the knowledge acquired during the training course. In particular, after the course the student should be able to:
- identify and appropriately use the principles and tools of the business model to design business development and management strategies;
 - recognize, analyze and solve an organizational problem;
 - identify and apply methodologies, languages and modeling tools for the analysis of business processes;
 - describe and use the main technologies and platforms information technology as well as the main applications and architectures for big data, data security and design of new products;
 - manage information, processes and resources to support the life cycle of products and services in complex business environments.
- Making judgements. Students are guided to learn and critically apply the models and methods of analysis acquired during the course identifying – with a high degree of autonomy and in a logic of integration – strategic, organizational and technological solutions for the creation of value and optimization of business processes. Students must therefore be able to operate in their own disciplinary and operational fields and manage complexity by collecting, processing and interpreting data, procedures and theories in a perspective of problem solving.
- Communication
Students must demonstrate that they have acquired the necessary skills to:
- guarantee an effective and correct oral and written communication of the acquired knowledge, taking into account the level of cultural preparation of the interlocutors;
 - organize the dissemination material and the communication of the research results using the scientific knowledge and the methodological tools learned.



	<p>- organise dissemination material and the communication of research results using the scientific knowledge and methodological tools learnt. Learning skill. Students must acquire the critical ability to relate, with originality and autonomy, to deepen and develop autonomously in the professional field the knowledge and skills gained in relation to business processes, business model and technological solutions to be adopted.</p> <p>Students must be able to update his knowledge and methods of investigation through opportunities for comparison and learning in their field of competence with a view to continuing their studies at a higher level (PhD) or in the broader perspective of cultural and professional self-updating of lifelong learning. Therefore, students must be able to switch to different forms of presentation from the original texts, in order to memorize, summarize for themselves and others, to disseminate scientific knowledge.</p>
Metodi didattici	<p>The training programme privileges transdisciplinarity and complementarity between didactic modules. Specifically, the course consists of:</p> <ul style="list-style-type: none">- frontal lessons, aimed at the exchange of knowledge and the development of a critical conscience within the disciplines studied through the transmission of concepts, models and interpretative schemes.- exercises, aimed at promoting the understanding of theories and models as well as facilitating the use of technologies and operational tools analysed in the classroom.- analysis of case studies, aimed at verifying and contextualizing what has been learned at a theoretical level through the frontal lessons.- group work, aimed at strengthening cognitive and operational learning by applying the logic of the Business Model and the theoretical notions acquired with frontal teaching. Group work is implemented in parallel with the training modules and discussed publicly at the end of the course to stimulate the comparison of competences and communication skills. <p>In order to promote an interactive learning experience and circular communication, students are invited to participate in the lesson with independent judgment, starting the debate in the classroom and presenting real cases.</p>
Modalità d'esame	<p>The exam is written. In addition, provision may be made for an oral examination to supplement the written examination. The presentation of the Project work carried out during the course is part of the verification of the acquired competences. During the exam the student is asked to argue theories, models and methodologies that are the subject of the study program to verify the level of knowledge and understanding of the topics covered as well as the degree of skills acquired. The student may be asked to do exercises and illustrate real cases related to the proposed question.</p>
Programma	<p>The course consists of four parts. Each section is divided into specific training modules.</p> <p>PART A – Business and Innovation Strategy (27 hours): Foundation of Strategy; Business Model;</p>



	<p>PART B – Organisational Analysis (27 hours): Network Analysis and Modelling; Organisational Theories and Structures;</p> <p>PART C – Business Process Management (27 hours): Enterprise Architecture, Business Process Management Lifecycle; Business Process Mining; Process Modelling Standards;</p> <p>PART D – Information and Communication Technologies (27 hours): taxonomy of business technologies; instruments for digitisation of business activities; Product Lifecycle Management; new technological trends.</p>
Testi di riferimento	<p>[1] Alexander Osterwalder A., Pigneur Y., Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers, Wiley, Hoboken, 2010.</p> <p>[2] Creswell J.W., Research Design, SAGE Publications.</p> <p>[3] Bryman A., Bell E., Business Research Methods, Oxford Press.</p> <p>[4] Powel W.W., Neither Market nor Hierarchy: networks forms of organizations, Research in Organizational Behaviour, vol 12, 1990.</p> <p>[5] Mintzberg H., The Structuring of Organizations, Prentice-Hall, Englewood Cliffs, 1979</p> <p>[6] Allee V., A value network approach for modeling and measuring intangibles, White Paper, 2002</p> <p>[7] Zachman J. A., “A framework for information systems architecture”, IBM Systems Journal, Volume 26, Issue 3, 1987.</p> <p>[8] Sowa J. F., Zachman J. A. (1992) “Extending and formalizing the framework for information systems architecture”, IBM Systems Journal, Volume 31, Issue 3, 1992.</p> <p>[9] Learning material provided by the professor.</p>
Altre informazioni utili	<p>Office Hours: by appointment; contact the instructor by email or at the end of class meetings.</p>



SCHEDA INSEGNAMENTO

MANUFACTURING QUALITY

Corso di studio di riferimento	LM54 - CdL Magistrale in Management Engineering
Dipartimento di riferimento	Dipartimento di Ingegneria dell'Innovazione
Settore Scientifico Disciplinare	ING-IND/16
Docente	Massimo Pacella
Crediti Formativi Universitari	9
Ore di attività frontale	81
Ore di studio individuale	144
Anno di corso	I anno
Semestre	II
Lingua di erogazione	Inglese
Percorso	PERCORSO COMUNE

Prerequisiti	Sufficiency probability theory and statistics
Contenuti	This course provides students with the analytical and management tools necessary to solve manufacturing quality problems and implement effective quality systems. Topics include quality systems and standards, the Six Sigma problem solving methodology, process capability analysis, measurement system analysis, gauge R & R, ANOVA and statistical process control.
Obiettivi formativi	<p>Knowledge and ability to understand. The course aims to provide useful knowledge on engineering techniques for statistical process control and their quantitative and qualitative characteristics. Specific attention will be devoted to the evolution of techniques related to the modern availability of measuring instruments.</p> <p>Ability to apply knowledge and understanding. Through the analysis of recent scientific literature and quantitative data related to case studies in engineering, we will provide analysis tools and statistical techniques applicable in various engineering fields, particularly in manufacturing. After the course the student should be able to: i) know the techniques of statistical process control in manufacturing and process companies; ii) know the methods and techniques of experiment design and analysis of experimental data; iii) know the advanced techniques of modeling / monitoring of measurement data.</p> <p>Autonomy of judgment. Through the study of theoretical approaches and the critical evaluation of different techniques, the student will be able to improve his judgment and proposal skills in relation to the engineering problem of statistical process control.</p> <p>Communication skills. The presentation of the course topics will be carried out in such a way as to allow the acquisition of the mastery of a technical language and of an appropriate specialist terminology. The</p>



	<p>development of communication skills, both oral and written will also be stimulated through the drafting of a work project that will be presented and discussed in the classroom during the final exam. Learning ability. The ability to learn will be stimulated through presentations and discussions in the classroom, aimed at verifying the effective understanding of the topics covered. The ability to learn will also be stimulated by the deepening of scientific articles related to research topics of statistical</p>
Metodi didattici	<p>The course consists of lectures based on the use of slides made available to students through this portal. Classes are aimed at achieving the training objectives through the presentation of theories, models and methods as well as the discussion of case studies in manufacturing field.</p>
Modalità d'esame	<p>Examination: oral. The exam consists in the presentation and discussion of the case-study assignment results by project groups. Case Study assignments should be completed in teams of 1 or 2. Teams of 3 may be allowed provided a request is made in advance to the instructor.</p>
Programma	<p>1. Quality Management System (9 hours) Quality planning. Quality assurance. Quality control and improvement. PDCA methodology (PlanDo-Check-Act) and other fundamental quality management principles. Six Sigma overview. The DMAIC (Define-Measure-Analyze-Improve-Control) problem solving process. Quality standards (ISO 9000, ISO 9001, ISO 9004). 2. Metrology principles (9 hours) International Vocabulary of Metrology (VIM) and the Guide to the expression of Uncertainty in Measurement (GUM) – basic and general concepts and associated terms. Quantities and units. Measurement. Devices for measurement. Properties of measuring devices. Principle of uncertainty calculation: types A and B uncertainties. Key dimensional metrology standards. Deformations and mechanical causes of errors. Marble, V-blocks, gauge blocks, and dial gauges. Vernier calipers. Micrometer or Palmer. Example of a laboratory model. Coordinate-measuring machine (CMM). PERCORSO COMUNE-used geometric models in dimensional metrology. Description of styli and types of probing. Software and computers supporting the CMM. Statistical issues in geometric feature inspection using CMMs. Sample size. Sample location. Measurement errors. Introduction to measurement by optical methods. 3. Statistical Process Control (SPC) (27 hours) Modeling process quality: describing variation. Important continuous distributions. Probability plots. Some useful approximations. Control chart for variables: chance and assignable causes of quality variation. Statistical basis of the control chart. Implementing SPC in a control chart for \bar{X} and R. Control charts for \bar{X} and S. The control chart for individual measurements. Procedures for \bar{X}, R and S charts. Case studies: applications of variables control charts. Control charts for sample proportions. Control charts for counts per unit of measure. EWMA control chart. CUSUM control chart. 4. Measuring Methods and Gauges (18 hours) Process and measurement system capability analysis. Process capability analysis using a histogram or a probability plot. Process capability ratios. Estimating the natural tolerance</p>



	<p>limits of a process. Tolerance limits based on the normal distribution. Nonparametric tolerance limits. Gauge and measurement systems capability studies. Isolate the components of variability in the measurement system. Accuracy and precision of a measurement system. The ANOVA (Analysis of Variance) approach for analyzing measurement data. 5. Analysis of Variance (18 hours) The ANOVA setting. Comparing means. The ANOVA model. Estimates of population parameters. Testing hypothesis in one-way ANOVA. The ANOVA table. The F test. Using software. The two-way ANOVA model. Main effects and interactions. Advantages of two-way ANOVA. Carrying out a two</p> <p>PROGRAMMA</p>
Testi di riferimento	<p>All lecture notes, data sets, solutions, and tutorials are available from the instructor. Montgomery D. C. (2013). Introduction to Statistical Quality Control, 7th Edition, Wiley.</p>
Altre informazioni utili	<p>Office Hours: By appointment; contact the instructor by email or at the end of class meetings</p>



OBIETTIVI FORMATIVI E PROGRAMMI DI MASSIMA DEGLI INSEGNAMENTI DI II E III ANNO

LM54 - CdL Magistrale in Management Engineering - II anno

ADVANCED TECHNOLOGIES IN MANUFACTURING

Obiettivi formativi

- * Knowledge of metal materials and processes for their transformation.
- * Basic knowledge for the characterization of superalloys.
- * Basic knowledge for characterization and use of Additive Manufacturing technologies.
- * Basic knowledge for finite element simulation of chip removal and forging processes.

Programma di massima

The course aims to deepen the aspects of object innovation in production technologies applied in the manufacturing sector with particular reference to the transformation of metallic materials for the production of high value-added products.

The materials/technologies solutions mainly used for realization of high performance products (both in terms of requirements and quality) will be discussed. The aspects related to the Workability of materials by chip removal technologies will be treated with particular reference to optimization of Material Removal Rate (MRR) according to the level of wear detected. The main elements that characterize the Additive Manufacturing technologies will be provided. The processes by plastic deformation will be analyzed, in particular the hot ones (forging, super plastic forming). The problem of defining performance materials as a function of microstructure will be addressed. The unconventional cold forming technologies of sheet metal, such as tube and sheet hydroforming, will be analyzed. Lastly, welding technologies and non-destructive testing for verification of product quality will be tackled. The base elements related to Smart Manufacturing (intended as an integrated approach: smart products, smart operators, smart workstations) and Cyber Physical Systems (CPS) will be provided. Numerical exercises and laboratory experiences will be carried out, in order to familiarize with the physical quantities that characterize machining operations and learn finite element simulation tools of chip removal and forging processes.



OBIETTIVI FORMATIVI E PROGRAMMI DI MASSIMA DEGLI INSEGNAMENTI DI II E III ANNO

LM54 - CdL Magistrale in Management Engineering - II anno

Digital Business

Obiettivi formativi

Knowledge and understanding. At the end of the course, the students will develop a broad spectrum of basic knowledge related to the competitive dynamics of the Digital Economy, e-Business models and strategies, e-Business adoption and digital transformation, e-Commerce standards, e-Business suite functional services, digital security, online payment, UML and XML.

Applying knowledge and understanding. At the end of the course, the students will be able to describe and define an e-Business Model, design a project for technology adoption within an organization, develop UML diagrams and XML documents, use the basic services of an e-Business suite, understand the main principles of digital security, know the main on line payment systems.

Making judgements. The course develops within students the ability of independent judgment in the appropriate choice of organizational model, competitive strategy, and technological solutions to support the development of an e-Business, as well as the critical ability to assess the sustainability of an e-Business.

Communication skills. The course provides students with the opportunity to develop effective communication skills by discussing business and technical presentations with a varied and composite audience having heterogeneous knowledge background, culture, and language. Besides, during the course, some visits nearby companies and seminars held by invited speakers are organized in order to support further the development of communication and interaction skills.

Learning skills. The course supports students to develop self-learning skills, in order to acquire the autonomy to deepen new topics that are related to the core contents of the course. This may happen during the discussion of case studies, or the development of the project work, or the usage of the e-Business suite.

Programma di massima

The course aims at providing a systemic vision on models and processes enabling Digital Business, and presenting the main characteristics and technologies.

It is discussed the strategic role played by the integration among digital technologies (including Internet) and the organizational change for the “digitization” and “transformation” of traditional businesses.

The course provides also a general overview about the main standards, techniques and functionalities of the technological platforms enabling a digital business.



OBIETTIVI FORMATIVI E PROGRAMMI DI MASSIMA DEGLI INSEGNAMENTI DI II E III ANNO

LM54 - CdL Magistrale in Management Engineering - II anno

Innovation Management

Obiettivi formativi

After the courses, students will be able to:

- identify the drivers and implications of technological innovation on the socio-economic performances of regions;
- define the main innovation sources and forms as well as to determine the value of a technology;
- identify timing and organizational features impacting on the success of an innovation strategy
- deploy an innovation strategy by leveraging on collaborative and open approaches.

Knowledge and understanding. At the end of the course, the students will develop a broad spectrum of basic knowledge related to the drivers and implications of technological innovation on the socio-economic performances of regions and companies by identifying areas of interventions at organizational, technological and strategic level.

Applying knowledge and understanding. At the end of the course, the students will be able to identify the main innovation sources and forms, to assess the value of a technology, to deploy an innovation strategy by leveraging on collaborative and open approaches, to design an organizational and technological model supporting the innovation by the organizations under the forms of product, process, marketing and organizational model.

Making judgements. The course develops within students the ability of independent judgment in the appropriate choice of organizational model, competitive strategy, and technological solutions to support the development of innovation.

Communication skills. The course provides students with the opportunity to develop effective communication skills by discussing business and technical presentations with a varied and composite audience having heterogeneous knowledge background, culture, and language. Besides, during the course, some visits nearby companies and seminars held by invited speakers are organized in order to support further the development of communication and interaction skills.

Learning skills. The course supports students to develop self-learning skills, in order to acquire the autonomy to deepen new topics that are related to the core contents of the course. This may happen during the discussion of case studies, or the development of the project works

Programma di massima

Understanding the fundamentals of innovation management in order to better comprehend the current technological environment, its trends and characteristics for grasping the entrepreneurial opportunities emerging in the knowledge economy. The course focuses on the dynamics of innovation at macro level, through the comprehension of dynamics of competitiveness related to the countries and regions on the basis of their innovation performances as well as on the organizations by exploring fundamentals of innovation strategies. A particular attention is reserved to the collaborative, open and user driven innovation approaches and the opportunities to innovate resulting from Big Data.



OBIETTIVI FORMATIVI E PROGRAMMI DI MASSIMA DEGLI INSEGNAMENTI DI II E III ANNO

**LM54 - CdL Magistrale in Management Engineering - II anno
PRODUCTION MANAGEMENT AND LEAN MANUFACTURING**

Obiettivi formativi

Il corso si prefigge di fornire agli allievi ingegneri gestionali una conoscenza dei paradigmi tradizionali ed innovativi della gestione della produzione mediante l'impiego degli strumenti teorici ed applicativi della pianificazione della produzione di medio e breve periodo.

Programma di massima

Saranno forniti gli strumenti teorici ed applicativi di analisi della domanda, di valutazione della redditività degli investimenti industriali nonché delle fasi principali della gestione dei sistemi project e dei servizi pubblici.



OBIETTIVI FORMATIVI E PROGRAMMI DI MASSIMA DEGLI INSEGNAMENTI DI II E III ANNO

LM54 - CdL Magistrale in Management Engineering - II anno

ROBOTIZED MANUFACTURING AND FMS

Obiettivi formativi

KNOWLEDGE AND UNDERSTANDING

After the course the student should understand the following aspects

- Flexible manufacturing system: configuration and management
- Robots in manufacturing environment: selection, configuration and management.
- Computer Aided Production: use of computer aided techniques to manage production

APPLYING KNOWLEDGE AND UNDERSTANDING

After the course the student should be able to

- formulate and solve problems concerning configuration and management of flexible production systems.
- select and program robotics in order to support CNC machines in production environment.
- assess the performance parameters and discuss issues related with different solutions.
- describe different approaches of production layout.
- formulate and solve production system configuration problems
- manage state-of-the-art techniques to represent part program

MAKING JUDGMENTS

Students should obtain the skill to compare pros and cons of different methods to the solution of a specific problem through examples and problems.

COMMUNICATION

The aptitude to communicate on technical issues should be obtained by discussing in a rigorous method both concepts and the accepted solution to a specific problem.

LEARNING SKILLS

Selected problems will be recommended that involve developing on presented theories and techniques. Identifying solutions to case study problems will be acquired for professional career.

Programma di massima

The aim of the course is the study of Robotized and Flexible Manufacturing systems. The first part addresses the production systems and their configuration. The second part of the course is oriented to Computer Aided Production



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OBIETTIVI FORMATIVI E PROGRAMMI DI MASSIMA DEGLI INSEGNAMENTI DI II E III ANNO

LM54 - CdL Magistrale in Management Engineering - II anno

Supply Chain management

Obiettivi formativi

Provide knowledge about the design and the management of industrial logistics systems based on lean management approach

Programma di massima

Logistics system design, lean management, supply chain management



OBIETTIVI FORMATIVI E PROGRAMMI DI MASSIMA DEGLI INSEGNAMENTI DI II E III ANNO

LM54 - CdL Magistrale in Management Engineering - II anno

Technological Entrepreneurship

Obiettivi formativi

Knowledge and understanding. At the end of the course, the students will develop a broad spectrum of basic knowledge related to the technological entrepreneurship as knowledge intensive process aimed to create socio-economic value from the exploitation of key enabling technologies as well as to understand patterns of entrepreneurial development high-tech and low-tech industries.

Applying knowledge and understanding. At the end of the course, the students will be able to identify areas of opportunities for the development of knowledge-intensive entrepreneurship in terms of creation of a new business and renewal of an existing business, to design a technological entrepreneurship roadmap, to evaluate the profitability of a technology intensive business.

Making judgements. The course develops within students the ability of independent judgment in the appropriate choice of revenue and business models, competitive and market exploitation strategies, exploration of technological solutions available for the development of an entrepreneurial venture.

Communication skills. The course provides students with the opportunity to develop effective communication skills by discussing business and technical presentations with a varied and composite audience having heterogeneous knowledge background, culture, and language. Besides, during the course, some visits nearby companies and seminars held by invited speakers are organized in order to support further the development of communication and interaction skills.

Learning skills. The course supports students to develop self-learning skills, in order to acquire the autonomy to deepen new topics that are related to the core contents of the course. This may happen during the discussion of case studies as well as during the development of the project works.

Programma di massima

The Course aims to introduce the subject of entrepreneurship as knowledge intensive and technology driven process for creating socio-economic value and supporting the regional growth. Starting from the comprehension of nature and trends characterizing the key enabling technologies, the course offers theoretical models and practical tools to innovate business existing and to create new entrepreneurial ventures.