



# UNIVERSITÀ DEGLI STUDI DI PALERMO

## Characteristics



## Educational objectives

The growing complexity and dynamism of the competitive system in the era of globalization and digitization requires new professionalism able to address the problems in an interdisciplinary, flexible and innovative way. The figure of the Management Engineer responds to the needs of today's markets and this is the reason why the Management Engineer is increasingly appreciated and required both in the business world and in the public administration.

The Management Engineering deals with the solution of problems of technical, economic, managerial and organizational nature in the processes of production and consumption of goods and / or services using methods and solving skills characteristic of engineering.

The management engineer uses quantitative tools, decision-making supports and methodological rigor typical of engineering sciences in order to achieve optimizing solutions. The engineering vision and method applied to management and organizational problems allow the achievement of higher levels of efficiency and effectiveness of solutions, contribute to a better understanding of business phenomena, facilitate the identification and control of the most significant decision variables in the various business processes, lay the foundation for continuous improvement of business results on measurable parameters and, finally, lend themselves to the construction of well-structured relationships between the various functions of the company and between companies.

While the preparation of a three-year management engineer is based on a solid basic training built on disciplines such as mathematics, physics, economics, statistics, operations research, computer science and design skills borrowed from the main engineering disciplines to which are added the characterizing disciplines, namely those relating to the fields of production technologies, industrial plants and economic-management engineering, the educational objective of the master's degree focuses more on the management training of the management engineer.

In particular, the learning objective of the master's degree program in management engineering, that is, to train an engineer-manager is translated into two specific sub-objectives:

The first specific learning objective is to transfer into the engineer student the so-called "hard" knowledge and skills of engineering-based management education, i.e., to provide in-depth, specialized, and scientific knowledge of managerial issues ranging from project management, innovation management, marketing, corporate finance, strategies, and supply chain management, as well as advanced technical skills for the "design" application of the acquired knowledge, for example, the skills of complex project management and quantitative and statistical analysis of business processes. Particular emphasis is also given to change management processes for the digitalization of the business and for the conversion towards the circular economy.

To achieve the first specific objective above, the training path is divided into 3 Learning Areas, which correspond to 3 blocks of disciplines:

- The Disciplines that constitute the methodological basis of the second level Management Engineer, i.e. the in-depth study of statistical methods for management engineering, the methodologies of analysis and modeling of business processes, the methodologies for project management;
- The Disciplines that constitute the managerial training of the second level Management Engineer or disciplines related to business functions such as marketing, finance, strategies, supply chain management and operations and cross-functional disciplines such as management of technological innovation and the design and management of customer satisfaction and human resources.
- The in-depth disciplines on management issues, the so-called advanced management knowledge areas, i.e., disciplines related to the aspects and challenges of enterprise 4.0, environmental and social sustainability, digital transformation, market globalization, and organizational entrepreneurship.

The second specific learning objective is to increase in the student master management engineer transversal skills and abilities, the so-called "soft skills", extremely important for a complete management training. The ability to listen and communicate, teamwork, flexibility and leadership have always been an important requirement for those who aspire to become managers. Moreover, in our globalized and highly competitive economy, soft skills have become a fundamental competence.

Add to that the fact that digital transformation has made the role of soft skills even more relevant. Implementing the digital transformation projects of companies and productive sectors requires much more than technologies. The ability to relate to, negotiate, lead and sponsor change is even more crucial, because cultural transformation is the basis of digital transformation.

Legenda: Per. = periodo o semestre, Val. = Valutazione (V=voto, G=giudizio), TAF= Tipologia Attività Formativa (A=base, B=caratterizzante, C=Affine, S=stages, D=a scelta, F=altre)

To address the second specific training objective, the teaching methodologies and content of individual lessons throughout the training are designed to stimulate:

- The development of soft-skills related to team working, self-entrepreneurship, and leadership. All courses include teaching activities of a "project" nature and use typical MBA teaching methodologies such as group-project, case study, flipped-classroom, in-class discussion precisely to stimulate these soft-skills.

- The development of soft-skills related to the aptitude for internationalization and global vision of markets. In addition, the fact that the course is delivered in English means that there are international students in the classroom and that an international atmosphere is created that can stimulate discussion and group projects towards a spirit of globalization.

- The interest in knowledge and technical skills related to the management of digital transformation and technological change in all business and corporate processes. In particular, the interactive and project-based teaching methodologies, as well as some theoretical content of the teachings will be explicitly aimed at developing the need for digital skills called for by the Digital Europe Program 2021-2027. The goal is to improve Europe's competitiveness in the global digital economy and achieve technological sovereignty. This is only possible by implementing and developing new digital technologies in order to support the digital transformation that will ensure high quality public services for the benefit of citizens and businesses.

## **Professional opportunities**

### PROFESSIONAL OPPORTUNITIES

Management engineer

function in a work context:

The identikit of the Management Engineer can be effectively outlined through what reported by Corriere della Sera of 31 March 2006: "An engineer-manager with high technical-scientific skills, able to manage financial and technological companies or to offer himself on the market as a high level corporate consultant. "

There are therefore two main functions that the Management Engineer usually performs.

The first function is that of MANAGER who, in addition to possessing an in-depth, specialized knowledge of the so-called traditional managerial issues, ranging from marketing, corporate finance, strategies, supply chain management, has a strong scientific-engineering background as well as the skills to face managerial challenges using the analytical tools of project management, advanced statistics for big data, modelling and analysis of business processes.

The second function is that of STRATEGIC AND OPERATIONAL CHANGE CONSULTANT, supporting but also guiding work groups, with manifold and transversal skills, leading the company towards complex improvement, innovation, and transformation projects. They are multifaceted professionals, with solid technical and scientific groundings, providing them the aptitude for problem-solving and for the adoption of an engineering approach to business consulting. They are specialists in the challenges of contemporary business, industry 4.0, environmental and social sustainability, digital transformation, market globalization, organizational entrepreneurship.

Skills:

For both functions, MANAGER and STRATEGIC-OPERATIONAL CONSULTANT, graduates in management engineering must possess both "hard", i.e., technical, and "soft", i.e., transversal skills.

In particular, the "hard" skills consists of in-depth knowledge of the main business functions such as corporate finance, marketing, operations and supply chain management, innovation management, strategic management as well as the ability to know how to apply this knowledge for solving business problems through advanced "business design" techniques such as project management, business process modelling and analysis, and statistical analysis techniques of business phenomena.

On the contrary, the "soft" skills associated with the functions described above are: the ability to listen and communicate, to work in a team, flexibility and leadership skills, all essential to be able to cover both the role of manager and of consultant. The conversion of the traditional economy into a circular economy on the one hand, and the digital transformation and opening to global business on the other, have made the role of soft skills even more relevant. The implementation of business transformation projects requires much more than hard technologies and skills. The skills to relate, negotiate, lead and sponsor change are even more crucial, because cultural transformation is the basis of all others.

Professional opportunities:

For both the first and the second function of the management engineer, the placement in the job market of graduates in Management Engineering is wide-ranging.

As a MANAGER, the management engineer finds work in any industrial sector. From manufacturing companies, such as automotive and agri-food, to service companies, such as energy transport and distribution companies. From private companies to public administrations. As an example, in recent years management engineers have been hired by the majority of the largest Italian companies such as Eni, Enel, Poste Italiane, Unicredit, Ferrero, Telecom, Bank of Italy.

Small and medium-sized companies (public and private) also represent a large employment area for management engineers. For example, in recent years, the latter are increasingly finding employment with managerial roles in public and private healthcare companies, in innovative start-up companies, small bio-technological companies, etc.

In the role of STRATEGIC-OPERATIONAL CONSULTANT, the management engineer is highly sought after by the most

important international consulting firms, such as Deloitte, PwC, KMPG, Ernst & Young, Accenture, MacKinsey, etc.

### Final examination features

The final examination consists of the preparation of the thesis and its presentation/defence, awarded with an adequate number of credits. The thesis work must be carried out under the guidance of a supervisor, and, as provided by the internal Regulations of the Master Degree Program in Management Engineering. The final work consists of a project work or research project in the field of every area of management engineering, ending with a thesis demonstrating the candidate's deep knowledge of the topic, her/his ability to work autonomously, his/her analytic capability to solve complex problems in business contexts. During the defence, candidates must demonstrate their communication skills in line with the educational objectives, their specialist knowledge of the subject, independent judgment, and investigation autonomy. The dissertation topic is chosen by the student, supervised by a Professor, and approved by the Board of the Degree Course. The thesis, whether it is the result of a scientific investigation, or the result of a project work (of any management-economic-organizational system), must present a solid theoretical background and literature analysis as starting point of the work performed and, at the end, should include the managerial implications of the work performed.

Subjects 1 ° year	CFU	Sem.	Val.	Att.	SSD	TAF
21678 - BUSINESS PROCESS MANAGEMENT <i>Bruccoleri(PO)</i>	9	1	V		ING-IND/35	B
17051 - CORPORATE FINANCE <i>Lo Nigro(PO)</i>	9	1	V		ING-IND/35	B
19022 - INNOVATION MANAGEMENT <i>La Commare(PO)</i>	6	1	V		ING-IND/16	B
22201 - ADVANCED STATISTICS FOR BUSINESS	6	2	V			
- MULTIVARIATE ANALYSIS: APPLICATIONS <i>Marcon(RD)</i>	3	2			SECS-S/02	C
- MULTIVARIATE ANALYSIS: THEORY <i>Lombardo(PO)</i>	3	2			SECS-S/02	C
04864 - MARKETING <i>Roma(PA)</i>	6	2	V		ING-IND/35	B
22217 - PROJECT MANAGEMENT <i>Riccobono(PC)</i>	6	2	V		ING-IND/17	B
14368 - SUPPLY CHAIN MANAGEMENT <i>Aiello(PA)</i>	9	2	V		ING-IND/17	B
Stage and others	6					F

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Subjects 2 ° year	CFU	Sem.	Val.	Att.	SSD	TAF
22198 - HR AND CHANGE MANAGEMENT <i>Pace(PA)</i>	6	1	V		M-PSI/06	C
22199 - INDUSTRIAL ORGANIZATION AND STRATEGY <i>Perrone(PO)</i>	9	1	V		ING-IND/35	B
20429 - FINAL EXAMINATION	15	2	G			E
Optional subjects	24					B
Free subjects	9					D

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## OPTIONAL SUBJECTS

Stage and others	CFU	Sem.	Val.	Att.	SSD	TAF
21167 - INTERNSHIP 2 CREDITS	2	1	G			F
11033 - INTERNSHIP 3 CREDITS	3	1	G			F
15458 - INTERNSHIP 4 CREDITS	4	1	G			F
11351 - INTERNSHIP 5 CREDITS	5	1	G			F
11028 - INTERNSHIP 6 CREDITS	6	1	G			F

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21778 - OPERATIONS AND SUPPLY CHAIN MANAGEMENT LAB	6	2	G			F
11034 - OTHER EDUCATIONAL ACTIVITIES - 1 CREDIT	1	1	G			F
11035 - OTHER EDUCATIONAL ACTIVITIES - 2 CREDITS	2	1	G			F
11036 - OTHER EDUCATIONAL ACTIVITIES - 3 CREDITS	3	1	G			F
11037 - OTHER EDUCATIONAL ACTIVITIES - 4 CREDITS	4	1	G			F
11038 - OTHER EDUCATIONAL ACTIVITIES - 5 CREDITS	5	1	G			F
11039 - OTHER EDUCATIONAL ACTIVITIES - 6 CREDITS	6	1	G			F
Optional subjects	CFU	Sem.	Val.	Att.	SSD	TAF
22249 - INNOVATION C.I.	12	2	V			
- PRODUCT/PROCESS INNOVATION <i>Micari(PO)</i>	6	2	V		ING-IND/16	B
- STRATEGIC MANAGEMENT AND OPEN INNOVATION <i>Piazza(RD)</i>	6	2	V		ING-IND/35	B
22250 - SMART FACTORY AND QUALITY - INTEGRATED COURSE	12	2	V			
- PROCESS AND SYSTEM SIMULATION <i>Buffa(PO)</i>	6	2	V		ING-IND/16	B
- SMART FACTORY <i>La Commare(PO)</i>	6	2	V		ING-IND/16	B
22251 - SUSTAINABILITY AND HEALTHCARE - INTEGRATED COURSE	12	2	V			
- SUSTAINABLE MANUFACTURING <i>Ingarao(PA)</i>	6	2	V		ING-IND/16	B
- HEALTHCARE OPERATIONS MANAGEMENT <i>Mazzola(PA)</i>	6	2	V		ING-IND/35	B

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