UNIVERSITÀ DEGLI STUDI DI PALERMO

Department: Engineering

A.Y. 2024/2025

DEGREE COURSE IN MANAGEMENT ENGINEERING

- DIGITAL TRANSFORMATION -

Characteristics

Class of Master's Degree (MSc) on Management engineering (LM-31)

2 YEARS

PALERMO

FREE ACCESS

2255

DOUBLE DEGREE

Instituto Universitario de Lisboa (ISCTE-IUL), Lisbona (PORTUGAL)
Vilnius Gediminas Technical University, Vilnius (LITHUANIA)

Educational objectives

The growing complexity and the dynamics of the competitive system, in the age of globalization and digitalisation require a new type of professionals, capable of facing issues in an interdisciplinary, flexible and innovative way.
Management engineers are an answer to current market needs, therefore they are always more appreciated and required both by companies and by public administrations.
Management engineering deals with the solution to technical, economical, operational and organizational problems in the processes of production and delivery of goods and services, through the typical engineering scientific methods and capabilities.
Management engineers, in their activity, use the quantitative tools, decision supports and methodological rigour typical of engineering sciences, aiming at optimizing solutions. The engineering vision and method, when applied to managerial and organizational problems, enable the achievement of the highest level of efficiency and effectiveness in solutions, contribute to a better understanding of business phenomena, facilitate the identification and control of the most significant decisional variables in various business processes, set the bases for the continuous improvement of business outcomes, based on measurable parameters and, eventually, are suitable to build well-structured relations among the various business functions and among companies.

While the preparation of a 1st cycle management engineer is based on a solid basic training built on disciplines such as mathematics, physics, economics, statistics, operational research, computer science and on the design skills borrowed from the main engineering disciplines, supplemented by class-specific subjects, such as those relating to the sectors of production technologies, industrial plants and economic-management engineering, the educational objective of the 2nd cycle course focuses more on managerial training.

In particular, the educational objective to train an engineer-manager, translates into two specific sub-objectives:

The FIRST specific OBJECTIVE is to transfer the so-called 'hard' knowledge and skills of engineering managerial training to the student engineer, i.e. to provide advanced, specialized and scientific knowledge of managerial issues ranging from project management to innovation management, marketing, corporate finance, strategy, supply chain management, as well as advanced technical skills for the application of acquired knowledge, such as the ability to manage complex projects and to carry out quantitative and statistical analysis of business processes. Particular emphasis is also paid to change management processes for the digitalization of the business and for the conversion to circular economy.
To achieve the first specific objective mentioned above, the training course is divided into 3 Learning Areas, which correspond to 3 blocks of teachings:

- The Disciplines constituting the methodological basis of the second level Management Engineer; the deepening of the statistical methods for management engineering, the methodologies of analysis and modelling of business processes, the

methodologies for project management;

- The Disciplines related to the managerial training of the second level Management Engineer, the so-called traditional management knowledge: teachings related to business functions such as marketing, finance, strategy, supply chain and operations management and cross-functional subjects such as the management of technological innovation and the planning and management of customer satisfaction and human resources.

- The in-depth teachings on management issues, the so-called advanced management knowledge, relating to the aspects and challenges of business 4.0, environmental and social sustainability, digital transformation, market globalization, organizational entrepreneurship. These advanced teachings find space within specific in-depth CURRICULA, enabling students to customize their training plan according to the type of in-depth study they choose.

The SECOND specific training OBJECTIVE is to increase the so-called 'soft skills', which are extremely important for an exhaustive managerial training. Listening and communication skills, teamwork, flexibility and leadership have always been an important requirement for those who aspire to become managers. Furthermore, in our globalized and highly competitive economy, soft skills have become a core competence. In addition, digital transformation has made the role of these skills even more relevant. The implementation of digital transformation plans for companies and production sectors requires much more than technologies. The skills to relate, negotiate, lead and sponsor change are even more crucial, because cultural transformation is the basis of digital transformation.
To meet the second specific educational objective, the teaching methodologies and the contents of the individual teachings of the course are designed to stimulate:

- The development of soft skills related to team working, self-entrepreneurship, leadership. All teachings include educational activities of a 'design' nature and use typical MBA teaching methodologies such as group-projects, case studies, flipped-classrooms, in-class discussions, precisely to stimulate these soft-skills.

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

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

Finally, we want to reiterate that the 2nd cycle degree course in management engineering is designed as a tech-MBA and, as such, the share of interactive and collaborative training activities (for example flipped-classroom or in-class discussion) are essential for increase the student's soft skills (as described above).

Professional opportunities

A national survey by ISTAT, published in 2004, about all the degree courses of all Italian Faculties, has put Managerial Engineers at the first places in the charts in career development ("89% of graduates find a stable job position within three years after finishing of ongoing studies.")
This trend is confirmed by the survey of 2011 (released in June 2012) which found that 95% of management engineers reach a stable job position.
The 2015 survey from AlmaLaurea consortium showed that 86% and 94% of senior management engineers found a stable job position within 1 and 3 years since graduation, respectively.
The survey also shows that more than 90% of the graduates are satisfied of their master degree course for the competences in their job positions.
All the results confirm that the management engineer is one the most appreciated professional figure.
The master degree program in Palermo is an answer to the requirements of the economical-productive system and its occupational rates are over the national average.
The senior management engineer finds professional opportunities in companies operating in the following sectors: consulting, manufacturing, logistics, marketing, utilities, ICT, healthcare, public administration, energy, banking, finance and so on.
The master degree council develops placement surveys on its graduates every two years. The last survey was released on 2015 and concerns the master graduates from 2009 to 2014.
A 97% of the respondent (138) have a stable job position (over the national average).
The master graduates usually get a first job interview within 3 months form the graduation and 26% of them got it by the Master degree council. Above 25% of them work in Sicily.

Final examination features

It consists of a dissertation with discussion of the results. The dissertation is awarded 15 credits. The final exam includes an important design work or scientific research, ending with a thesis on a management engineering subjects. It aims to prove the ability of the candidate to operate autonomously, his/her analytic capability and complex problem solving skills. During the discussion of the dissertation, candidates must demonstrate their communication skills in line with the educational objectives,

their specialized knowledge of the subject, independent judgment and investigation autonomy. The dissertation topic is chosen by the student and approved by the council of the master degree course. The thesis can be either a systematic and critical literature review or the proposition of the chosen topic and can be a novel approach to solve a given management engineering problem both theoretical and empirical. The thesis can also be developed ad a detailed an engineering design project.

Subjects 1 ° year	CFU	Sem.	Val.	Att.	SSD	TAF
21678 - BUSINESS PROCESS MANAGEMENT *Bruccoleri(PO)*	9	1	V		ING-IND/35	B
17051 - CORPORATE FINANCE *Lo Nigro(PO)*	9	1	V		ING-IND/35	B
19022 - INNOVATION MANAGEMENT *La Commare(PO)*	6	1	V		ING-IND/16	B
22201 - ADVANCED STATISTICS FOR BUSINESS	6	2	V			
- MULTIVARIATE ANALYSIS: APPLICATIONS *Marcon(RD)*	*3*	*2*			*SECS-S/02*	*C*
- MULTIVARIATE ANALYSIS: THEORY *Lombardo(PO)*	*3*	*2*			*SECS-S/02*	*C*
04864 - MARKETING *Roma(PA)*	6	2	V		ING-IND/35	B
22217 - PROJECT MANAGEMENT *Certa(PA)*	6	2	V		ING-IND/17	B
14368 - SUPPLY CHAIN MANAGEMENT *Aiello(PA)*	9	2	V		ING-IND/17	B
Free subjects	9					D
	60					

Subjects 2 ° year	CFU	Sem.	Val.	Att.	SSD	TAF
22248 - DIGITAL TRANSFORMATION - INTEGRATED COURSE	18	Ann.	V			
- DIGITAL MARKETING *Roma(PA)*	*6*	*1*			*ING-IND/35*	*B*
- SMART FACTORY *La Commare(PO)*	*6*	*1*			*ING-IND/16*	*B*
- SUPPLY CHAIN MANAGEMENT 4.0 *Aiello(PA)*	*6*	*2*			*ING-IND/17*	*B*
22199 - INDUSTRIAL ORGANIZATION AND STRATEGY *Perrone(PO)*	9	1	V		ING-IND/35	B
22396 - LAB OF BUSINESS PROCESS DIGITALIZATION *Bruccoleri(PO)*	3	1	G			F
05917 - FINAL EXAMINATION	15	2	G			E
Optional subjects	6					B
Optional subjects II	6					C
Stage and others	3					F
	60					

OPTIONAL SUBJECTS

Stage and others	CFU	Sem.	Val.	Att.	SSD	TAF
22147 - ENGINEERING PROFESSIONAL PRACTICE *Barcellona(PA)*	3	1	G			F
23902 - FORENSIC WENGINEERING *Barcellona(PA)*	3	1	G			F

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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
22395 - LAB OF CROWDSOURCING *Piazza(RD)*	3	1	G			F
22397 - LAB OF LIFE CYCLE ASSESSMENT *Ingarao(PA)*	3	1	G			F
22394 - LAB OF STATISTICS *Lombardo(PO)*	3	1	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
Optional subjects	**CFU**	**Sem.**	**Val.**	**Att.**	**SSD**	**TAF**
22341 - ADDITIVE MANUFACTURING *Fratini(PO)*	6	2	V		ING-IND/16	B
22339 - ADVANCED PROJECT MANAGEMENT FOR BUSINESS	6	2	V		ING-IND/17	B
17882 - DIGITAL MANUFACTURING *Emami(RD)*	6	2	V		ING-IND/16	B
23152 - DIGITAL PRODUCT MANAGEMENT	6	2	V		ING-IND/35	B
22321 - HEALTHCARE OPERATIONS MANAGEMENT *Mazzola(PA)*	6	1	V		ING-IND/35	B
22346 - MANUFACTURING PROCESSES FOR THE CIRCULAR ECONOMY *Ingarao(PA)*	6	2	V		ING-IND/16	B
21512 - PROCESS AND SYSTEM SIMULATION *Buffa(PO)*	6	2	V		ING-IND/16	B
21675 - PRODUCT/PROCESS INNOVATION *Micari(PO)*	6	1	V		ING-IND/16	B
22347 - PUBLIC SECTOR AND WELFARE ECONOMICS *Abbate(RU)*	6	1	V		ING-IND/35	B
24189 - REVERSE LOGISTICS AND SMART WASTE MANAGEMENT *Aiello(PA)*	6	1	V		ING-IND/17	B
16079 - SAFETY MANAGEMENT *La Fata(PA)*	6	2	V		ING-IND/17	B
22196 - SERVICE QUALITY DATA-DRIVEN MANAGEMENT *Lupo(PA)*	6	1	V		ING-IND/16	B
23218 - SMART CONTRACTS, BLOCKCHAIN AND CYBER SECURITY AWARENESS	6	1	V		ING-IND/35	B
22197 - STRATEGIC MANAGEMENT AND OPEN INNOVATION *Piazza(RD)*	6	1	V		ING-IND/35	B
24188 - SUSTAINABILITY MANAGEMENT *Mazzola(PA)*	6	2	V		ING-IND/35	B
21668 - SUSTAINABLE MANUFACTURING *Ingarao(PA)*	6	1	V		ING-IND/16	B
22342 - TECH ENTREPRENEURSHIP *Perrone(PO)*	6	2	V		ING-IND/35	B

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OPTIONAL SUBJECTS

Optional subjects II	CFU	Sem.	Val.	Att.	SSD	TAF
21506 - BIG DATA AND ANALYTICS - INTEGRATED COURSE	6	2	V			
- MACHINE LEARNING *Tinnirello(PO)*	3	2	V		ING-INF/03	C
- DATA ANALYTICS AND STORAGE *Lo Presti(PA)*	3	2	V		ING-INF/05	C
23217 - BUSINESS ANALYTICS *Mancini(PA)*	6	1	V		MAT/09	C
19220 - CYBERSECURITY *Gallo(PA)*	6	1	V		ING-INF/05	C
22198 - HR AND CHANGE MANAGEMENT *Pace(PA)*	6	2	V		M-PSI/06	C
20462 - PRINCIPLES OF SMART GRIDS *Riva Sanseverino(PO)*	6	2	V		ING-IND/33	C
05871 - PROGRAMMING *La Cascia(PO)*	6	2	V		ING-INF/05	C

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