

# MASTER OF SCIENCE IN INDUSTRIAL ENGINEERING AND OPERATIONS RESEARCH

MINOR: AUTOMOTIVE PRODUCTION ENGINEERING

120 ECTS – LANGUAGE: ENGLISH – DEGREE: MASTER OF SCIENCE

## COURSE CONTENT

The master's programme combines the disciplines of Industrial Engineering and Operations Research into a single study program.

**Industrial Engineering** (IE) is an engineering domain that deals with analysing, designing and optimising complex operational systems, with the aim of improving their effectiveness and efficiency, and thus increasing their productivity. A unique feature of IE that distinguishes it from other engineering disciplines, is the explicit consideration of the human element as an essential and determining factor of these operational systems. For designing operational systems, an IE engineer often relies on mathematical models, both of deterministic and stochastic nature, that are then subjected to simulation and optimisation techniques. The whole of these mathematical tools is known under the term **Operations Research** (OR). They comprise mathematical programming, simulation, search algorithms and heuristics, dynamic programming, queueing theory, decision techniques, statistics, stochastic modelling, network analysis, etc. Since many years, the combination of both disciplines forms a crucial engineering domain for companies worldwide. This engineering profile is highly wanted in companies because of the positive impact it has on their operational and organisational structures. Internationally, it is one of the largest engineering domains that effectively prepares students for taking up leading roles and management responsibility by thoroughly training them in the organisational and technical principles of systems in manufacturing and service industries.

## COURSE STRUCTURE

Becoming a master in IEOR involves two phases: the first three years of study lead to the degree of Bachelor in Engineering Sciences and in the next two years the degree of Master in Engineering Sciences is obtained. The master's programme combines courses in the core disciplines of IE and OR, but also provides room for elective courses.

## CAREER PERSPECTIVES

The Master of Science in Industrial Engineering and Operation Research is geared towards training young engineers to become operational specialists in designing, installing and managing industrial production and service systems, taking into account scientific, technological, economical, organisational and human factors. It is clear that many companies, both small and large, are eager to recruit these engineers. Internationally, experience with master's programmes in industrial engineering shows that graduates quickly grow towards responsible leadership functions, i.e., the company management. Furthermore, IEOR engineers are not only found in industry but also in many organisational systems of society such as government, health care and hospitals, public service, law enforcement, transport and traffic systems, et cetera. It is also a core discipline in less traditional engineering environments: consumer-directed service companies, super-market chains, retail companies, health services, consulting, etc.

IEOR engineers are often responsible for the operational aspects of organisations in functions like production manager, head of development, logistics manager ... and are found in all levels of the management. They also function as specialists ('methods engineer') in supporting departments of large companies and international corporations. Notable examples of what IEOR has to offer in today's society can be found on [www.iienet.org](http://www.iienet.org), the web site of the Institute of Industrial Engineering (IIE) which is the international professional organisation of engineers in this discipline.

The organisation of European students of Industrial Engineering and Managements (ESTIEM) can be found on [www.estiem.org](http://www.estiem.org).

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## TOELATINGSVOORWAARDEN VOOR HOUDERS VAN EEN VLAAMS DIPLOMA

### Rechtstreeks:

- Ba ingenieurswetenschappen (alle, uitgez. Ba ingenieurswetenschappen: architectuur)
- Ma ingenieurswetenschappen (alle met titel burgerlijk ingenieur, uitgez. Ma ingenieurswetenschappen: architectuur)
- Ma in Engineering (alle, met titel burgerlijk ingenieur, uitgez. Ma Architectural Engineering)  
*opleiding(en) oude structuur:*
  - burgerlijk ingenieur (alle)
  - bio-ingenieur (alle)

### Rechtstreeks: (naar brugprogramma - 120 studiepunten)

- Ma industriële wetenschappen (alle)  
*opleiding(en) oude structuur:*
  - industrieel ingenieur (alle, met uitzondering van industrieel ingenieur landbouw en biotechnologie)

### Via voorbereidingsprogramma: (max. 90 studiepunten)

- Ba bio-ingenieurswetenschappen
- Ma bio-ingenieurswetenschappen (met titel bio-ingenieur)
- Ma Bioscience Engineering (met titel bio-ingenieur)
- Ba/Ma ingenieurswetenschappen: architectuur
- Ma in Architectural Engineering
- Ba/Ma toegepaste economische wetenschappen: handelsingenieur
- Ba/Ma toegepaste economische wetenschappen: handelsingenieur in de beleidsinformatica
- Ma Business Engineering
- Ba/Ma wiskunde (alle)
- Ba/Ma fysica en sterrenkunde
- Ba/Ma fysica
- Ba informatica/Ma wiskundige informatica
- Ba ingenieurswetenschappen (KMS)
- Ba industriële wetenschappen (alle)  
*opleiding(en) oude structuur:*
  - handelsingenieur
  - licentiaat wiskunde
  - licentiaat natuurkunde
  - licentiaat informatica

### TAAL

Je voldoet aan de taalvoorwaarden op basis van je Vlaams diploma.

## PRAKTISCHE INFORMATIE

### Studieprogramma:

<https://studiegids.ugent.be>

> faculteiten > opleidingstypes > ga naar de opleiding van je keuze

### Alternatieve trajecten

Meer informatie over voorbereidings- en brugprogramma's op [www.ugent.be/ea](http://www.ugent.be/ea)

volg > alles voor toekomstige studenten > voor wie al een diploma heeft

### Infomomenten

#### Masterbeurs

[www.ugent.be/masterbeurs](http://www.ugent.be/masterbeurs)

#### Opleidingsgebonden infosessie

18 april 2018 - 17 u.-19 u. doorlopend, Campus Ufo, Ufo,

Sint-Pietersnieuwstraat 33 - Foyer

[www.ugent.be/nl/studeren/masteropleidingen](http://www.ugent.be/nl/studeren/masteropleidingen)

### Contact

Trajectbegeleiding:

[studietrajectplateau.ea@ugent.be](mailto:studietrajectplateau.ea@ugent.be)

### Meer info

Afdeling Studieadvies – Campus Ufo, Ufo,

Sint-Pietersnieuwstraat 33, 9000 Gent, T 09 331 00 31

[studieadvies@ugent.be](mailto:studieadvies@ugent.be) – [www.ugent.be/studieadvies](http://www.ugent.be/studieadvies)

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## ADMISSION REQUIREMENTS FOR INTERNATIONAL DEGREE STUDENTS

Students who wish to enrol for the Master of Science in Industrial Engineering and Operations Research can enter the programme without any prerequisites if they hold the following diploma: an academic diploma of Bachelor (or Master) of Science in Engineering (university level, minimum three years), and/or a Master of Science in BioScience Engineering or an equivalent to this.

Admission can only be granted after an individual application procedure. The Study Programme Committee will make the final decision whether to accept the application or not. The Study Programme Committee can decide that students need to follow a preparatory course or an individual Master's programme, for instance for students with another diploma of Bachelor or Master.

### LANGUAGE

More information regarding the required knowledge of English:  
[www.ugent.be/language/requirements](http://www.ugent.be/language/requirements)

## PRACTICAL INFORMATION

### Study programme

[www.ugent.be/coursecatalogue](http://www.ugent.be/coursecatalogue)

> by Faculty > Programme types > select your programme

### Application deadline for international degree students

- for students who need a visa: 1st of March
- for students who do not need a visa: 1st of June

[www.ugent.be/deadline](http://www.ugent.be/deadline)

### Enrolling institution

Ghent University

### Tuition fee

More information is to be found on:

[www.ugent.be/tuitionfee](http://www.ugent.be/tuitionfee)

### Contact

Faculty of Engineering and Architecture

International Relations Officer – Degree students

Annelies Vermeir – [annelies.vermeir@ugent.be](mailto:annelies.vermeir@ugent.be)

T +32 9 264 36 99 – [internationalplateau.ea@ugent.be](mailto:internationalplateau.ea@ugent.be)

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