

## **Premaster programs 'Industrial Engineering and Management' (IEM) 2017-2018**

The master Industrial Engineering and Management has three specializations:

- Production and Logistics Management (PLM)
- Financial Engineering and Management (FEM)
- Health Care and Technology Management (HCTM)

### Production and Logistic Management (PLM)

This track focuses at the heart of the design and control of manufacturing processes in the supply chain from raw material delivery to delivering end products to customers. PLM is a broad field that requires people with knowledge of and insight in models in production and logistics in the tradition of management science. Modern production and logistic processes are becoming increasingly complex. Product lifetimes are decreasing, the geographic distance between suppliers and buyers becomes increasingly large (globalization) and more and more activities are outsourced. Important issues in supply chain design include:

- Location of production facilities, distribution centers;
- Allocation of resources in production, distribution centers;
- Management of operations in production, warehousing, transport and distribution, purchasing;
- Maintaining desired service levels to customers;
- Process reliability and its interaction with maintenance planning.

Any mismatch in the supply of raw materials, semi-raw materials, components or finished products will lead to overstock or production delays with service consequences.

The Health Care Technology and Management (HCTM) track highlights the issues that play a role in the management of health care organizations. The special emphasis of this track is on the organizational aspects of hospitals from an Industrial Engineering and Management point of view. Furthermore, we focus on the management and organizational aspects of the development and implementation of biomedical technology. Some of the courses will be given along with the Master's degree programme Biomedical Engineering. You will be prepared to increase the organizational effectiveness, efficiency and safety of health care. In addition to knowledge of medical aspects, this demands effective managerial insight as well. The HCTM track of the 'Industrial Engineering and Management' Master's degree program differs from other educational programs in that, in preparing you for a career in the health care sector, it highlights the quantitative analysis of problems and the methods used in producing goods or services.

### Financial Engineering and Management (FEM).

Over the past decade, the increasing complexity of financial products, the size of the markets, and the ever increasing variety in the products traded have generated a growing demand for skilled professionals to create, price and hedge complex derivatives and, more generally, to manage risk. Acquiring such skills requires mastering both mathematical and managerial knowledge. To meet this demand, the Department of Financial Engineering (in co-operation with the Department of Applied Mathematics) offers a master's track in financial engineering and risk management. Students are trained to identify and quantify risk. Moreover, they should be able to determine the extent to which risk should be dealt with using financial engineering instruments or other types of solutions, such as reengineering business processes, adapting the firm's strategy, switching customers/suppliers or taking different investment decisions. Students will also benefit from comprehensive management training, learning to apply strategic skills to manage the firm's innovation and technology.

## Admittance

Students with a BSc in Industrial Engineering and Management from a Dutch Research University are admitted directly to the master program. Students with other prior knowledge may have to do a premaster program first to be admitted. The fulltime IEM premaster programs start once a year in September.

For students with a Technical Program from a Research University, the premaster program takes 15EC minimum. For students with a technical program from a University of Applied Sciences or a Social Science program from a Research University, the premaster program takes 30EC.

## Admission Criteria for the premaster program

Admission to the premaster program is an individual assessment, based on the following criteria:

- Level of Mathematics (at least equal to the Dutch pre university Mathematics B)
- Prior education
- CGPA (excellent on quantitative courses)
- Study progress
- Motivation
- CV (extra curriculaire activities)

Dutch students who do not meet the mathematics criteria can upgrade their deficiencies, e.g.:

1. [Babel and Boswell Bèta](http://www.boswell-beta.nl/) or <http://www.boswell-beta.nl/> also available in English <http://www.boswell-beta.nl/en/>
2. A State exam, see <http://www.ccvx.nl/>
3. UvA: <http://kdvi.uva.nl/education/zomercursus/wiskunde-b/zomercursus-wiskunde-b.html>
4. Some Universities of Applied Sciences offer extra 'Technical Mathematics' courses themselves, like Saxion.

You can apply for admittance online, see [www.utwente.master.nl](http://www.utwente.master.nl). Students who are integrating the premaster program in their HBO program of a University of Applied Sciences, can apply via <https://www.kiesopmaat.nl/>

The program consist of lecturers, tutorials, assignments and self-study. Study slots are scheduled over the week and a lot of self-study is asked.

**The premaster program should be completed successfully within one academic year (with 2 exam opportunities per course) to be admitted to the master program.**

Each specialization has a premaster program. For the specializations PLM and HCTM the premaster program is the same. The premaster program for the specialization FEM differs from the other two specializations.

## The premaster programs

If you are a student with a technical program from a Research University and you are admitted to one of the premaster programs, you have to take up to 15EC of courses. Per specialization below you find the premaster programs.

## 1. Research University : Technical Program

Research University Technical programs			
<b>PLM/HCTM Technical programs</b>			
Course Code	Course Name	EC	quartile
191530420	Statistics & probability for premaster IEM	5	1
201500012	OR models for premaster IEM	10	1
		<b>15</b>	
<b>PLM/HCTM Technical program CReaTe</b>			
Course Code	Course Name	EC	quartile
201500292	Linear algebra	3	1
201700018	Probability Theory	2	1
201500012	OR models for premaster IEM	10	1
		<b>15</b>	
<b>FEM Technical programs</b>			
Course Code	Course Name	EC	quartile
191530420	Statistics & probability for premaster IEM	5	1
201500020	Financial Engineering for premaster IEM	10	1
		<b>15</b>	
<b>FEM Technical program CReaTe</b>			
Course Code	Course Name	EC	quartile
201500292	Linear algebra	3	1
201700018	Probability Theory	2	1
201500020	Financial Engineering for premaster IEM	10	1
		<b>15</b>	

## 2. University of Applied Sciences and Research University: Social Science Program

If you are a student with a technical study program from a University of Applied Science or a student with a Social Science Program from a Research University and you are admitted to one of the premaster programs, then you have to take up to 30EC of courses. The premaster courses depend on the chosen specialization. Below you find the premaster programs per specialization.

Applied Science program and Research University Social Science Program					
Production and Logistics Management / Health Care and Technology Management					
First Quartile (Sept-Oct)			Second quartile (Nov-Febr)		
Course code	Course name	EC	Course code	Course name	EC
191512001	Calculus A	4	191530420	Statistics & probability for premaster IEM	5
201500014	Academic skills for premaster IEM	1	201500014	Academic skills for premaster IEM	4
201500012	OR models for premaster IEM	10	201500015	Excel/VBA	3
			201400317	Operations Strategy*	3
			201500019	Project OMfor premaster IEM(3 EC)	
		15			15
					30
Financial Engineering and Management (FEM)					
Course code	Course name	EC	Course code	Course name	EC
191512001	Calculus A	4	191530420	Statistics & probability for premaster IEM	5
201500014	Academic skills for premaster IEM	1	201500014	Academic skills for premaster IEM	4
201500020	Financial Engineering for premaster IEM	10	201500015	Excel/VBA	3
			201400317	Operations Strategy*	3
			201500019	Project OMfor premaster IEM(3 EC)	
		15			15
					30

\* students with prior knowledge on this topic will have to do Project OMfor premaster IEMinstead

In the education catalogue Osiris you can find course descriptions soon:  
<https://osiris.utwente.nl/student/OnderwijsCatalogusKiesCursus.do>

## Literature:

Below you find the literature you will need for the premaster courses, as far as they are known at the moment of writing. You can order your books, with discount, via the study association STRESS. But first you have to register as a member of STRESS, see <https://www.stress.utwente.nl/>

Calculus a: Thomas' Calculus, early transcendentals, G.B. Thomas, M.D. Weir and J.R. Hass New International Edition, ISBN 9781783991587

Academic skills for premaster: 'Geen probleem: Een aanpak voor alle bedrijfskundige vragen en mysteries', by Hans Heerkens & Arnold van Winden or Business Research Methods, and Skills Sheets (Ten Tulder)

OR models for premaster IEM: W.L. Winston, Operations Research (4th ed), ISBN 0-534-42362-0

Financial Engineering for premaster IEM: Brealey, Myers and Allen, Principles of Corporate Finance, most recent international edition, with access to the self-study tool Connet. (ISBN 9780077155070) and online articles.

Excel/VBA: online material

Statistics and Probability: online material and Applied Statistics and Probability for Engineers" by D.C. Montgomery and G.C. Runger (5de edition, ISBN 978-0-470-50578-6)

Operations Strategy: Slack, N., Chambers, S., & Johnston, R. (2010). Operations Management (7th ed.). Harlow: FT Prentice Hall

## Examination

Per course the examination differs:

	Exam type	Lecturer
1. Calculus (191512001, 4 EC)	Exam	dr. J.C.W. van Ommeren
2. Academic skills for premaster IEM (201500014, 5 EC)	Assignment (individual)	dr.ir. S.J.A. Löwik
3. OR models for premaster IEM (201500012, 10 EC)	Exam + group assignment	dr.ir. L.L.M. van der Wegen
4. Statistics & Probability (191530420, 5 EC)	Exam	ir. T.M.J. Meijer
5. Financial Engineering for premaster IEM (201500020, 10EC)	Exam + group assignment	dr. B. Roorda
6. Excel/VBA (201500015, 3 EC)	2x test	prof.dr.ir. E.W. Hans
7. Operations Strategy (201400317, 3EC) *	Exam	dr.ir. N.J. Pulles
8. Project OM for premaster (201500019, 3EC)	Assignment (group)	dr.ir. L.L.M. van der Wegen

Per course you can take one exam and one re-sit. If the premaster program is not finished successfully during one academic year, admission to the master program is not possible anymore.

Students in special circumstances have to ask the exam committee for exemptions on the above mentioned rules. The exam committee decides on individual issues as presented by the student.

After finishing your premaster program and your Bachelor or BSc program, you can start the master. The Master contains 120EC.

## General Information

### Introduction

The introduction for (pre)master students takes place during the last week of August. This introduction is important to get acquainted with fellow students and education facilities of the University. **This information is not offered again during the (pre)master program.** If you cannot be present here you can gather your information via our website or ask fellow students. For participation in the Introduction program you have to register in: <http://www.kick-in.nl/>

### Readers

If readers are used, you can buy them in the first week of education at the Union shop in the 'Bastille' building.

### Osiris

The student administration is done in Osiris. Before starting your course you have to register yourself for courses in Osiris. When you are registered in Osiris you also are registered for the exam of that course and you automatically have access to Blackboard. You can register yourself in Osiris with your student account + password. For more information see also <http://www.utwente.nl/onderwijssystemen/en/>

### Blackboard

The University uses Blackboard as an electronic learning environment. Blackboard is our communication channel for course content, exams etc. For more information see: <https://blackboard.utwente.nl/webapps/blackboard/>

### Time schedule + program + rules

Information concerning time schedules can be found on: <https://rooster.utwente.nl/?newLocale=en>

Information concerning programs can be found on: <https://www.utwente.nl/iem/en/pre-master/>

Information concerning rules can be found on:

<https://www.utwente.nl/en/bms/education/regulations/>

During the introduction an overview of the most important issues will be given.

### Contact:

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