

## Introduction lecture IEM program

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(on behalf of Erwin Hans,  
Director of TBK and IEM programs)  
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## Industrial Engineering & Management (IEM)

- Improving processes and systems
- Modeling and quantitative analysis paradigm
- Applied in a variety of fields (manufacturing, finance, logistics, telecommunications, healthcare)
- Multiple objectives (quality, service, risk management, productivity, or safety)

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## IEM

- Multidisciplinary, with an open mind for:
  - Technology used in processes
  - Human behavior (individual and social)
  - Conditions in the environment of the organization (competitors, regulations, or government policies)

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## Industrial *Engineers*

- Work on real-world problems
- Good math and quantitative skills
- Combine knowledge from different disciplines for designing solutions
- Project-management expertise
- Communication skills
- Creative, resourceful

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## IEM specializations

- Production and Logistic Management
- Financial Engineering and Mgmt
- Information Technology and Mgmt
- Health Care Technology and Mgmt
  
- In fact each student has an individual program to a certain extent.

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## IEM specialization coordinators

- FEM: Dr. Berend Roorda
- ITM: Dr. Fons Wijnhoven
- HCTM: Dr. Marjan Hummel
- PLM: Dr. Leo van der Wegen

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## Standard program

- See Course Schedule IEM 2012-2013: <http://www.utwente.nl/smg/education/education-ma/iem/studyprogramme/studprog/>
- You have a lot of freedom to adapt it to your personal interests!

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## 120 EC

- 2 mandatory common courses: 10 ec
- 7 specialization-specific courses: 35 ec
- 2 equalization courses: 10 ec
- 6 electives: 30 ec
- Master's thesis: 30 ec, preparation 5ec
- 4 quarters of 15 ec = 60 ec/year
- 15 ec = 420 hrs = 10 weeks
- Each quarter has 3 courses of 5 ec

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## Common courses

- Introduction to IEM (**Mandatory**)
- Empirical research and data analysis (**Mandatory**)
- "Management of technology for..."
- Organization and strategy
- Management and organization of technological innovation

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## Equalization courses

- To repair deficiencies, we have two so-called "equalization courses", early in the program
- For students who have a Dutch BSc in IEM: these are electives
- For other students: these courses are selected with you (no electives) as preparation for the specialization courses (Discuss with specialization coordinator!)

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## Electives

- Which electives can you choose? Other IEM specialization courses and (almost) any master course offered by EWI, CTW, or TNW (there may be constraints from their side (prior knowledge) or from our side (overlap))
- Master courses from other (inter)national technical programmes
- Discuss with specialization coordinator!

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## Electives (2)

"Industrial Engineering" is a much broader field at the University of Twente (see [www.utwente.nl/ie](http://www.utwente.nl/ie))

- Applied Mathematics
- Business Info Technology
- Computer Science
- Mechanical Engineering
- Civil Engineering & Mgmt
- Industrial Design Engineering
- Biomedical Engineering

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## Electives (3) Study abroad

- Erasmus programme
- Contact Inge van Haare and specialization coordinator in an early stage
- Approval from examination committee needed
- Examples: Linköping, Gothenburg

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## Preparing your Thesis

Start in **first year** M1.2 (Intro IEM) Portfolio: find individual assignments for (research) orientation during the year:

- Approved study programme
- Research about job areas and positions for IEM graduates
- Assessment of a finished MSc thesis
- Review of a scientific paper

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## Preparing your Thesis (2)

In **second year**: (M2.1) Portfolio

- Obtaining Master assignment (M2)
- Motivation letter for the master assignment
- Individual study programme and the related agreements with the specialisation coordinator
- Overview of study grades and study progress

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## Preparing your Thesis (3)

In **second year**: (M2.2)

- Finalizing portfolio
- Preparing Master assignment
  - Literature study
  - Organisation visits
  - Plan of approach
- Grading preparation course by thesis supervisor

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## Preparing your thesis (4)

- New course,
- Mandatory for students starting in 2012-2013 and for students who started in 2011-2012 (or earlier) who do not start their final project before February 2014 (with a study speed comparable to the speed of last year).

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## Preparing your thesis (5)

- MSc syllabus available in November
- Start M1 activities in Intro IEM 2012
- If you already finished Intro IEM, perform obligations by yourself! (You may want to take some of the newly developed Intro IEM lectures)
- For students starting IEM in February 2013, instructions will follow

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## Final project

- Final projects are usually conducted outside the university
- Challenging: real organization, real problem, so you need to provide a real contribution
- Start early finding an internship for your final project (M2.1 or earlier)
- Ask practical advice on resume, letter, contacts, etc.

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## Final project coordinators

- FEM: Dr. Berend Roorda
- ITM: Dr. Fons Wijnhoven
- HCTM: Dr. Marjan Hummel
- PLM: Dr. Marco Schutten

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## Individual program adjustments

- If you have ideas about your individual study program that go beyond the standard conditions: make a proposal! We welcome your initiatives
- Discuss with specialization coordinator or program director
- (You always complete 120 ec, so there are no exemptions)

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## Proactive

- We welcome diversity and invite ideas for taking courses
- Some courses will require more than the standard workload for some individuals (and less for others)
- Be proactive when it comes to planning, electives, required advance knowledge, etc.

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## ROLE OF SPECIALIZATION COORDINATOR (1)

- Advice on and approval of
  - Pre-master courses
  - Equalization courses
  - Study plans
  - Electives
- Track coordinator sends this information to BOZ (student administration) accompanied by a study plan

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## STUDY PLAN

- What courses are studied when?
- No more than 4 courses per quarter
- Preliminary knowledge
- Study seriously!
  
- Note: There will always be some knowledge gaps, so, if necessary, search for literature and study a topic yourself!

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## ROLE OF SPECIALIZATION COORDINATOR (2)

- Advice on individual master programme, e.g.
- Combination of 2 specializations
- Taking courses at other universities
- Study abroad for one semester
- Approval via examination committee, positive advice from specialization coordinator needed

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## FRAUD IS NOT TOLERATED

- Using unauthorized aids like mobile phones or calculators
- Consulting someone else's notes
- Committing forgery
- Plagiarism = copying without crediting the source (internet, books, articles, reports from other students,...)
- Punishment: exclusion from exams for a whole year!

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## Questions

- Equalization courses, electives, planning your pre-master courses: *specialization coordinator*
- Other questions about planning, rules, personal circumstances: *study advisor* (Cornelis ten Napel)
- Other issues: *program coordinator* (Mrs. Bernadette Pol) or *program director*

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## PRODUCTION AND LOGISTIC MANAGEMENT

- Specialization coordinator Leo van der Wegen
- RA 3355
- Telephone: 053-4893501
- l.l.m.vanderwegen@utwente.nl

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## PRODUCTION AND LOGISTIC MANAGEMENT

- Focuses on design and control of logistic processes in the entire supply chain e.g. production planning, transportation planning, network design, purchasing, reverse logistics,...
- Modeling, quantitative analysis
- Performance oriented (costs, service,...)
- Application of operations management in healthcare

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## PROGRAM

- Two courses are mainly method oriented (Discrete optimization of business processes, Simulation)
- Most other courses focus on areas within logistics and on applications (Warehousing, APP, Purchasing, SCTM, RLRM, OHCP2,...)
- Equalization courses (10 ec)
- Master's thesis (30 ec)
- Electives

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## PROGRAM (mandatory)

|           |   |
|-----------|---|
| 191820160 | Purchasing                                  |
| 191820200 | Discrete Optimization of Business Processes |
| 191820210 | Simulation                                  |
| 191820190 | Supply Chain - & Transport Management       |
| 191852620 | Advanced Production Planning                |
| 191820120 | Warehousing                                 |
| 201100163 | Management of Technology for PLM            |

## ELECTIVES (examples)

|           |  |
|-----------|--|
| 191852640 | Production & Logistic IS                         |
| 191820180 | Reverse Logistics & re-manufacturing             |
| 194121020 | Optimization of Healthcare Processes             |
| 191852630 | Reliability engineering & Maintenance management |
| 194122030 | New Production Concepts                          |

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## ELECTIVES (examples)

- 192850730 Governing Product Development
- 192850740 Product Life Cycle
- 191102040 Manufacturing Facility Design
- 191581420 Optimization Modelling
- 191531830 Stochastic Models in Production and Logistics
- 195810600 Project Control & Risk management
- 201100010 Intelligent Transport Systems
- 195810200 SCM & ICT

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## ELECTIVES

- The course "Design of production and inventory systems (191124720)" is NOT allowed as elective, because it has a lot in common with other IEM-PLM courses

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## EQUALIZATION COURSES

- Prescribed by specialization coordinator in consultation with the student, but:
- Prescribed by coordinator in case of serious deficiencies!
- Dutch BSc IE&M students: electives
- HBO: SMOM mandatory

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## EQUALIZATION COURSES (2)

- Courses especially developed for students with a "different" background, e.g. students with a ME background from abroad:
- OR Methods (NOT meant for Dutch BSc. IEM students and premaster students)
- Forecasting and Inventory Management (limited number of Dutch BSc. IEM students and premaster students allowed)

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## Information Technology & Management

- Track coordinator Fons Wijnhoven
- RA 3341
- Telephone: 053-4893853
- a.b.j.m.wijnhoven@utwente.nl

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## Information Technology & Management

- Focuses on design and exploitation of information and information technology resources
- Analysis of requirements for business processes, services design, managing use, integration of processes by IT
- Performance and use oriented (costs, service levels,...)
- Applications in e.g., healthcare, banking, manufacturing, logistics, media industry,

## PROGRAM

- General IEM courses
- Equalization courses (10 ec). E.g., Gegevensbanken; Software engineering models; Telecommunication systems; Business function support; Business process support
- I-track electives
- Master's thesis (30 ec)

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## PROGRAM (mandatory)

|           |   |
|-----------|---|
| 191863960 | Foundation of Information systems         |
| 192376500 | Business Process Integration Lab          |
| 193160060 | Information Services                      |
| 191852640 | Production & Logistic IS                  |
| 192376000 | Business Case Development for IT Projects |
| 192340101 | Implementations of IT in organizations    |
|           | Management of Technology P/H/F            |

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## ELECTIVES (examples)

|           |                           |
|-----------|---------------------------|
| 192350200 | E-strategizing            |
| 192320501 | Electronic Commerce       |
| 192360021 | ICT Management            |
| 201100052 | Global Project Management |
| 191820210 | Simulation                |

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## ELECTIVES (examples)

- Information & Knowledge Exchange Services
- Datawarehousing & business intelligence
- E-Health strategies
- BIT courses (23.....code)

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## FINANCIAL ENGINEERING AND MANAGEMENT

- Specialization coordinator Berend Roorda
- Telephone: 053-4894383
- RA 3349
- b.roorda@utwente.nl

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## FINANCIAL ENGINEERING AND MANAGEMENT

- How to deal with financial risk and trading these?
  - Domain  
banks ... insurance ... pension funds
  - Products  
shares ... derivatives ... structured products
  - Perspective  
trading ... hedging ... risk management

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## PROGRAM (mandatory)

|           |                                   |
|-----------|-----------------------------------|
| 191515603 | Introduction to Investment Theory |
| 191506103 | Statistics and probability        |
| 191515201 | Mathematical Finance              |
| 191570350 | Financial Econometrics            |
| 191860181 | Risk management                   |
| 191570300 | Structured Products               |
| 201100162 | Management of Technology for FEM  |

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## ELECTIVES (examples)

|           |   |
|-----------|---|
| 191860651 | Micro Economics                               |
| 191599850 | Special topics in Financial Engineering       |
| 191861641 | Financial accounting                          |
| 201000202 | Management Control for Financial Institutions |
| 191820210 | Simulation                                    |

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## HEALTH CARE TECHNOLOGY AND MANAGEMENT

- Specialization coordinator Marjan Hummel
- RA 5248
- Telephone: 053-4893340
- j.m.hummel@utwente.nl

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## HEALTH CARE TECHNOLOGY AND MANAGEMENT

- Focuses on hospitals (health organizations)
- Improving health care processes
- Implementation and evaluation of new biomedical technology
- Market and technology development for biotech

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## PROGRAM (mandatory)

|           |   |
|-----------|---|
| 191820200 | Discrete Optimization of Business Processes |
| 191820210 | Simulation                                  |
| 194121020 | Optimization of Healthcare Processes        |
| 194112110 | Health & Health Systems                     |
| 193640070 | Clinical Safety and Quality Assurance       |
| 192360501 | E-health strategies                         |
| 201000182 | Management of Technology for Health Care    |

## ELECTIVES (examples)

|           |  |
|-----------|--|
| 194111210 | Medical decision making                        |
| 194111220 | Clinical efficacy & MTA                        |
| 194112060 | The Nature of Hospital Work Healthcare Workers |
| 194112170 | Quality and Safety in Health Care              |
| 191820120 | Warehousing                                    |
| 192340101 | Implementation of IT in Organizations          |

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## Technology Venturing and Innovation Management

- a) Management of Organisation and Technology Innovation
- b) Organisation, Technology & Innovation (201000088)

Business Development in Network Perspective (194108040),

Two of the below mentioned courses:

- a) Innovation & Technology Dynamics (194111500) or,
- b) Principles of Entrepreneurship (194108030) or,
- c) HRM, Innovation & Entrepreneurship (194121040), or
- d) Entrepreneurial Finance (201000087) or
- e) Supply Chain Management & Innovation (201100054)

Advanced Technology Venturing group proj. (201100062)

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## W+P1a (premaster students)

- Voor wiskunde moeten studenten:
  - \* de eerste 6 weken meedoen bij wiskunde 1
  - \* week 7 en 8 wiskunde aspecten bestuderen in zelfstudie onder begeleiding van een student assistent
  - \* zich inschrijven voor en meedoen aan het tentamen wiskunde 1
  - \* op het tentamenformulier de vakcode van wiskunde en programmeren 1a schrijven

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## W+P1a (premaster students)

- Voor programmeren moeten studenten:
  - \* zich inschrijven voor en meedoen aan het tentamen programmeren toets 1
  - \* op het tentamenformulier de vakcode van wiskunde en programmeren 1a schrijven

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## QUESTIONS

?

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## STUDY PLAN

- DetModOR (Linear programming) → DOBP, Warehousing
- Statistics & Probability, Logistics Management (inventory control) → SCTM
- Statistics & Probability → Simulation, REMM
- DOBP, Simulation → OHCP2
- DOBP → SCTM
- SMOM (PPS) → APP
- Statistische technieken → ERDA

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