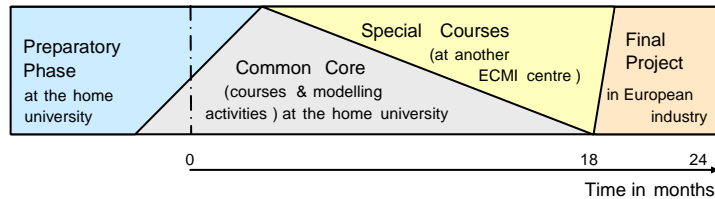


# European Masters Education in Industrial Mathematics

## Structure of Study Programme



## Modelling Seminar

» *Training of mathematical modelling* «

- ✓ Working in small groups
- ✓ Modelling of real life problems (not necessarily new)
- ✓ Analysis of the model, contact to the company
- ✓ Providing numerical solutions
- ✓ Writing reports
- ✓ Presentation

## International Modelling Week

» *Modelling of real life problems in international groups of students* «

- ✓ Takes place annually at one of the ECMI centres
- ✓ Small groups of mixed nationalities tackle real life problems from a wide range of fields
- ✓ The group is supervised by an instructor who submitted the problem
- ✓ The week finishes with a presentation
- ✓ Afterwards the groups write a report to be published in proceedings

## Final Project

» *Industrial project including the Final Report* «

- ✓ Mathematical model and relevant solution to a real industrial problem (non-trivial mathematics)
- ✓ Placement in European industry or at an ECMI centre in partnership with a company
- ✓ is finished with an industrial report (sufficient scientific and mathematical level ~ engineering paper) and a presentation
- ✓ Benefit from the work has to be positively assessed by the company where the problem originates

## Central Aim

Education of students and graduates at universities to become capable industrial mathematicians

## Trained capabilities

- ▶ Modelling and analytical skills
- ▶ Knowledge of numerical methods
- ▶ Training in programming and simulation packages
- ▶ Experience with mathematical models in Industry
- ▶ Team working
- ▶ Partial studies abroad (4 months) or placement in European industry (4-6 months)
- ▶ Communication with and presentations to mathematicians and non-mathematicians

## Further information:

<http://www.ecmi-indmath.org/>

## Contact:

Prof. Aleksander Weron (*Economathematics*)  
<http://www.im.pwr.wroc.pl/~weron>

Prof. Wojciech Okrasiński (*Technomathematics*)  
<http://www.im.pwr.wroc.pl/~okrasins>



European Consortium  
for Mathematics in Industry

European Masters Education in  
INDUSTRIAL MATHEMATICS

- Founded in 1986 by mathematicians from 10 European universities who realized the need of interaction between universities and research groups in industry
- Operates on a European scale
- Aims to promote the use of mathematical models in industry
- Offers a network of collaborating Masters programme to educate industrial mathematicians satisfying the growing demand for such experts

- Research:**
- ⇒ Study groups
  - ⇒ Special interest groups on research in industrial mathematics
  - ⇒ Research network, e.g. for the glass industry
  - ⇒ Biennial Conference

**Education:** *The “Educational Committee”*

- ⇒ organises the
  - “European Masters Education in Industrial Mathematics”  
(Technomathematics - Economathematics)
- ⇒ gives advice on educational matters.
- ⇒ Every ECMI Centre is represented.

## Why join the programme?

The demand of highly qualified industrial mathematicians the European industry is steadily increasing.

*Many interesting and challenging jobs are permanently offered by industrial and business companies.*

Therefore since 1986 ECMI offers such programmes based on its collective knowledge and expertise of European industry.

Training on the application of Mathematics in industry, business and commerce can be obtained at least partially at the Departments of Mathematics of Technical Universities.

## When and What

Normally after an undergraduate university mathematical education a student has sufficient background to meet the requirement for entering the two-year European Masters Education in Industrial Mathematics in one of its branches

### Technomathematics:

covers subjects related to modelling of technical problems as encountered in mechanics, pharmacy, electronics, physics, chemistry, bioengineering, civil engineering, environment etc.

### Economathematics:

deals with problems like e.g. planning and scheduling, operation analysis, quality control, statistics, distribution management, financial decision processes and data communication

## What are the main aspects of the programme?

The programme

- **includes** enhanced applied Mathematics
- **trains** mathematical modelling of industrial (real life) problems and stimulates close contacts to companies and businesses
- is **taught** in English and
- **operates** on a European scale by means of a lively exchange of students and teachers between the ECMI centres. This feature of the programme is supported by the European Community (Leonardo-, Erasmus/ Sokrates- and other programmes)
- **contains** an international ECMI ‘Modelling Week’ each year, bringing together all European students enrolled in the programme
- **finishes** with a thesis written in English, preferably after a half-year industrial placement and conducted in collaboration with a company. On successful completion of the programme a graduate will be awarded the **ECMI-Certificate**.

## Where

ECMI centres and collaborating universities (2007):

- Austria  
Johannes Kepler University Linz  
Technical University Graz
- Denmark  
Technical University of Denmark Lyngby
- Finland  
Lappeenranta University of Technology
- France  
University Joseph Fourier Grenoble  
Institut National de Sciences Appliquées de Rouen
- Germany  
University of Kaiserslautern  
Technical University of Dresden
- Italy  
University of Milano  
University of Firenze
- Norway  
Norwegian University of Science and Technology Trondheim
- The Netherlands  
Technical University of Eindhoven
- Poland  
Wroclaw University of Technology
- Serbia  
University of Novi Sad
- Spain  
Autonomous University of Barcelona  
Carlos III University of Madrid
- Sweden  
Chalmers University of Technology Göteborg  
Lund University
- United Kingdom  
University of Oxford  
University of Strathclyde Glasgow  
University of Bristol  
University of Southampton