

The Course:

From metabolic flux analysis to biological process control: a digest with worked examples and real-life applications

- Mathematical modeling of ecological and biological systems
- Compartmental systems
- Biological networks, and metabolic flux analysis
- Linear and nonlinear parameter estimation, parameter identifiability and experiment design
- Design of software sensors (state estimation)
- Optimal, optimizing and predictive control
- Matlab worked examples and real-case applications in various fields (water treatment, anaerobic digestion, food science and predictive microbiology, etc.)

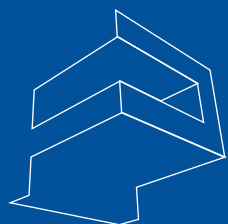
The Faculty of Engineering...

The Faculty of Engineering has been training engineers **since 1837 and awards engineering degrees** (Bachelor, Master, PhD) in **six different fields of engineering**:

Architecture, Chemistry & Materials, Computer & Management, Electricity, Mechanics, Mining and Geology.

Our students are eager to transfer the knowledge they have acquired into real engineering skills by solving real-life design problems.

It plays today a leading role in the scientific and economical role of its region, namely with the local research centres Materia Nova and Multitel.



LOCATION

Faculté Polytechnique de Mons
Boulevard Dolez 31 – 7000 Mons – Belgium

ACCOMMODATION

Accommodation (including breakfast) in student halls of residence is included in the “all-inclusive” formula. Accommodation is available from Sunday 30th June PM to Wednesday 10th July AM.

REGISTRATION

The application deadline is 2nd June 2019.

The number of participants is limited, and applications will be handled on a first-in policy. The registration procedure is detailed on the course website.

FEES

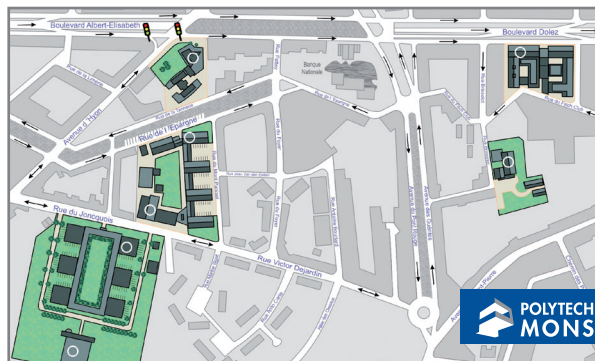
Three options are offered to the university students (Bachelor's Degree, Master's Degree, PhD):

- A. Courses only (4 days, lunch included), without accommodation : 250 €
- B. Courses and Conference (7 days, lunch included), without accommodation: 500 €
- C. Courses, Conference, city trips to Antwerpen and Reims, accommodation and meals (breakfast, lunch and dinner): all-inclusive formula (10 nights)
 - 1500 €
 - 1250 €, reduced fee for students from partner institutions

Travel expenses are not included

CONTACT

summer.polytech@umons.ac.be



A detailed and updated program of the activities is available on www.umons.ac.be/polytech/summercourses

INTERNATIONAL SUMMER COURSE IN ENGINEERING

2019



30th June - 9th July

Faculty of Engineering - Mons – Belgium

UMONS
Université de Mons

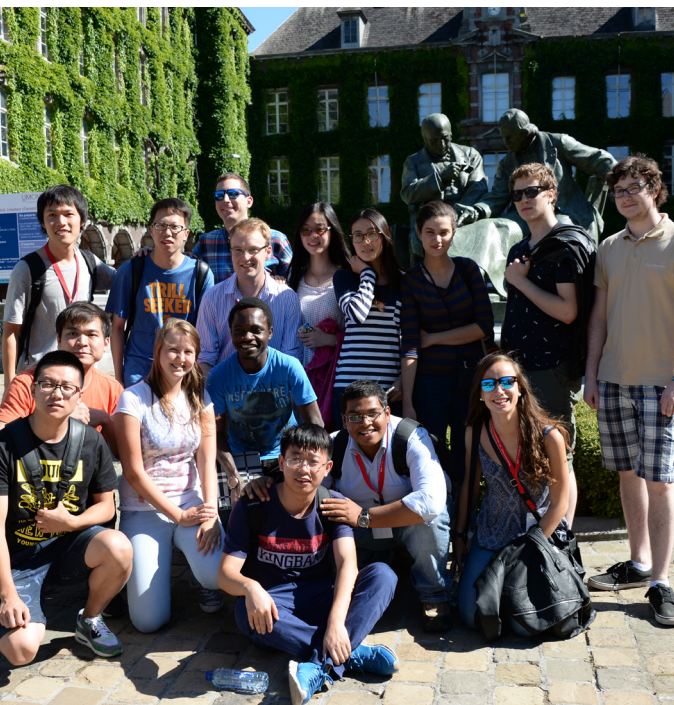
**POLYTECH
MONS**

Our student committee...

Our student committee, «**the Polytech International Mons'ters**», includes students from Bachelor and Master levels. This student group will take part in the organization of several social and cultural activities during the week-end, and all along the week, during the evening time. These activities will be a good introduction to the university life and the city of Mons.

Let us make this Summer Course an amazing experience!

- You will also take part to cultural events and social activities in or near Mons, organized by students with whom you will interact daily.
- A general welcome is scheduled on Sunday, 30th June in the evening.



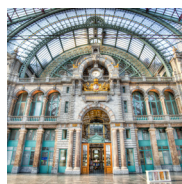
A scientific Conference within the Summer Course

The course is organized in 4 sessions of 6 hours each (July 1-2, and July 8-9, 2019), back to back with the 9th IWA Specialized Conference on Sustainable Viticulture, Winery Wastes & Agri-industrial Wastewater Management, which is an international workshop focusing on the recent advances in topics such as winery and brewery wastewater characterization, waste and wastewater management, aerobic and anaerobic treatment processes, sustainable viticulture and oenology (reducing waste), solid waste treatment and byproduct recovery, environmental assessment, fermentation technology, smart and sustainable farming.

The conference features plenary lectures and contributed presentations by specialists in the fields. The conference also includes technical visits to a winery and a distillery. Information is available at www.winery2019.com

Discover breweries and wineries in their local environment!

Guided tours will be organized for an affordable price.



Saturday 8th July: ANTWERPEN

Visit of the City, lunch, visit of a local brewery



Sunday 9th July: REIMS

Visit of the Cathedral, lunch, visit of a champagne cellar

THE LECTURERS :

JAN VAN IMPE

Prof. Jan F.M. Van Impe obtained an MSc degree in electrical and mechanical engineering from the University of Gent in 1988, and a PhD in applied sciences from the KU Leuven in 1993. Thereafter, he founded the BioTeC (Chemical and Biochemical Process Technology and Control) research group, spanning research in predictive microbiology, biotechnology, environmental processes, and systems biology and control.

He (co-)authored more than 600 full papers in international journals and international conference proceedings, and edited several books in these areas. Over the period 1998-2018 he (co-)supervised over 60 PhD theses. In 2018, he was awarded a honorary doctorate (honoris causa) by ULB.

GEORGES BASTIN

Prof. Georges Bastin is a specialist in the control of complex dynamic systems. He is particularly interested in modeling and control of compartmental dynamical systems, network systems and systems governed by conservation laws (partial differential equations). He has studied a variety of applications ranging from biotechnology to free-surface hydraulic systems, road networks, communications and robotics. Georges Bastin has always had the constant concern to develop academic and industrial partnerships by being involved in numerous contracts or research programs. He is the author of more than 300 referenced publications (book chapters, articles of international journals and international conferences). He is co-author of 2 books, and several lecture notes. In 2012, he was awarded a honorary doctorate (honoris causa) by Grenoble INP.

ALAIN VANDE WOUWER

Prof. Alain Vande Wouwer graduated in Electrical Engineering from the Faculté Polytechnique de Mons (Belgium) in 1988, and obtained a PhD in Applied Sciences from the same university (in collaboration with Stuttgart University for a European doctorate degree) in 1994. This latter year, he also achieved a postdoctoral stay in the Mechanical Engineering Department of Université Laval (Quebec). Since then, he has been working at the University of Mons, where he is currently the head of the Control Department. For the last 20 years, he has focused most of his research on numerical simulation, bioprocess modeling, estimation and control, developing collaborations with industries and international research groups. In recent years, he also engaged in research on flight control of unmanned aerial vehicles. Alain Vande Wouwer was (co-)supervisor of 20 PhD theses, and co-author of 2 books and about 100 journal articles.