





CONFINDUSTRIA Genova supports International Master MIPET since its begin and promotes these initiatives among Industrial Community

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IPF<sup>-</sup>

industrial plant engineering and

technologies

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# Genoa University, Polytechnic School & Engineering Faculty

The University of Genoa is one of the oldest in Italy and in the World (founded in 1471 AD), it is located in middle of Italian Riviera. The students are about 40,000 (about 8,000 new entries), and the Engineering Departments involve around 7,500 students distributed among Genoa Locations and two External Sites: Savona Campus and La Spezia Area Recently the Polytechnic School was established combining Engineering Faculty and Architecture in order to reinforce the vocation of Genoa University to be an International Leader in Innovative Technologies in a wide spectrum of applications For further Information about

the Engineering & University of Genoa:



www.itim.unige.it www.ingegneria.unige.it www.unige.it

Prof.Aristide Fausto Massardo

# Ordine degli Ingegneri della Provincia di Genova





strong cooperation between Academic and Technical Experts coming from Leading Universities and Companies operating in this area with special attention to Engineering and Construction in

Power Generation, Iron & Steel and Environment.





The International Master in Industrial Plant Engineering and Technologies (MIPET) is a one-year degree program organized in Genoa University focusing on preparing new generations of top quality engineers to be dedicated to process and plant engineering, projects and activities within Industrial Plants, EPC and construction companies.

The Master Program is directed by the DIME Engineering Department and Polytechnic School in close cooperation with a number of industrial partners which represent some of the best reputed global players in the Engineering and Construction market.

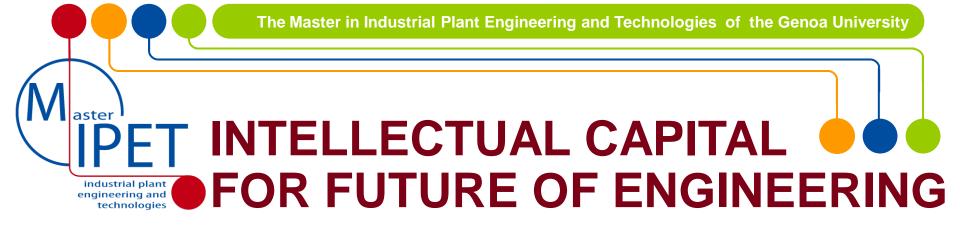
The main goal of MIPET is to meet the requirements of such industrial partners in terms of professional skills and technological competencies for young leading engineers.

As a matter of fact, this project it is part of a larger program devoted to exploit the synergy among Genoa University Engineering Faculty and top level Engineering & Construction

Companies and to pursue the Innovation and Excellence in processes and products through a continuous enhancement of their competitive assets: technologies, human capital, know how, models and skills.







Jack Welch (GE CEO 1981-2001 from \$14 billions market value to over \$410 billions): Globalization has changed us into a company that searches the world, not just to sell or to source, but to find Intellectual Capital - the World's Best Talents and Greatest Ideas













Scientists investigate that which already is; Engineers create that which has never been *Albert Einstein (Physics Nobel Price 1921, Princeton University)* 



Prof. A.G.Bruzzone MIPET Director

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This Master is devoted to create System and Process Engineers, Technical Coordinators operating effectively in Project Teams in Global Engineering and Construction. MIPET provides a deeper insight in Industrial Plants and enables the students to get a complete overview of a project with all its technical aspects along each project stage: Proposal, Basic and Detailed Engineering, Procurement, Manufacturing, Erection, Commissioning and Service. MIPET graduates acquire capabilities in all the critical areas (mechanical, materials, processes and components, electrical, instrumentation & automation, cost estimate, project management, risk & safety, quality assurance) combined with a specific training in specific industrial sectors (i.e. Power Equipment, Iron & Steel) as well as with Internship Experiences in Companies.















## **BENEFITS FOR YOUNG ENGINEERS**

- High Profile Professional Education devoted to provide High Value Skills in Industrial Plant Engineering and Technologies
- Continuous Interaction with Top Quality Experts from Academia, Institutions and leading Engineering & Construction Companies.
- Very Qualified Selection and Evaluation Processes that guarantee the Master Attendees as highly qualified resources for top companies.
- Opportunities to complete experiences On Field on complex Industrial Plant projects
- Contacts and visibility to major E&C\* Companies and EPC\*\* Contractors (EPC) operating at International and National level.
- Developing Human Potential of the attendees by training and improving their Individual and Team Working capabilities.
   \* E&C Engineering & Contracting



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**EPC Engineering, Procurement & Construction** 













- The Master is based on MIPET agreement among Genoa University the Sponsoring Companies and Genoa University. In fact MIPET Industrial Sponsors financed extensively the past editions (from 80% till 100%), confirming the strong interest in this initiative and its ROI\*
- To attend the Master, each applicant is requested to pass a selection process based on Interview (Live or by Phone/Skype) and Qualification (i.e. Curriculum Vitae).
- The MIPET Selection combines Technicians, Human Resource, Experts from Academia and Industry to identify best candidates (e.g. 120 applications, 60 selected interviews, 15 selected master attendees)
- The MIPET Tuition Fee is 7'500.00 Euro, but a full coverage of tuition fee is available for best candidate and many scholarships & grants are available for good students
- In all past MIPET editions <u>each student received at least a 6'000.00 Euro grant in advance</u> <u>from Companies and/or Governmental Institutions</u> and have to pay only 1'500.00 Euro for being enrolled at selection procedure completion (no extra payment required)
- In previous MIPET Editions, the Students successfully achieving the Master Degree and hired by MIPET Sponsors received a full refund (100%) of Tuition Fees
- MIPET is establishing agreements with major Universities around the World for promoting this education initiative as well as the cooperation on Industrial Plant Engineering & Technologies



#### aster IPET industrial plant engineering and technologies GRANTS & PLACEMENT



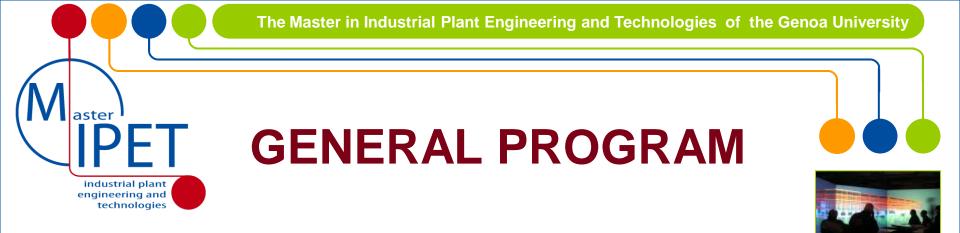
- The job placement is very good both in terms of numbers and quality; placement statistics confirm that more than 80% of students from previous Editions were hired by leading industries and major companies operating in industrial sector after graduation.
- All MIPET Sponsor Companies are interested and committed to evaluate the best MIPET students for job positions and, in case of selection, the Sponsors will hire these people and recognize them the efforts for attending MIPET, at least, by refunding the full tuition fee including the 1st Payment 1'500.00 Euro
- Master Students and Companies have the opportunities to know each other during the Internship & Project Work improving professional Curriculum and placement opportunities
- MIPET organizes periodic group and individual meetings between Sponsor Companies and MIPET Students, as well as orientation meetings, in order to finalize internship and

cooperation agreements





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The Master in Industrial Plants includes:

- Basic Modules for Industrial Plant Engineering and Construction, including Process Engineering, Plant Automation, Materials & Technologies, etc.
- Operative Modules on Critical Issues for Industrial Plants (e.g. Engineering Standards and Regulations, Project Management, Quality Assurance etc.)
- Thematic Modules on Specific Plant Sectors (e.g. Power, Iron and Steel, Environment)
- Company Internships devoted to acquire on-field experience, including the development of the Project Work related to a Real Case
- Visits to Industrial Plants and Engineering, Research & Development Centers and Labs.
- Tests for certifying individual skills and capabilities acquired by the attendees on specific topics at the end of each single module.
- Professional Modules, integrated in the Master Program, but open for external attendees as stand alone courses. These modules include individual and team Projects Works to be carried out in competition/cooperation interacting with experts.





Operative Modules are compact and specific courses (1-5 days), which are an integral part of the Master and at the same time are open and offered to external companies, technical employees or professionals interested in these subjects. MIPET Sponsors get 2 free seats in each Operative Module and are entitled to get discounts and opportunities for further registrations into Operative and Thematic Modules.

These modules are carried out jointly by the Industry and the Academy and are characterized by strong interaction between students and teachers through simulations and Role Play Games performed on specific case studies. Among the others the following modules are foreseen:

- Engineering Standards and Regulations
- Construction
- Project Management
- Safety & Risks

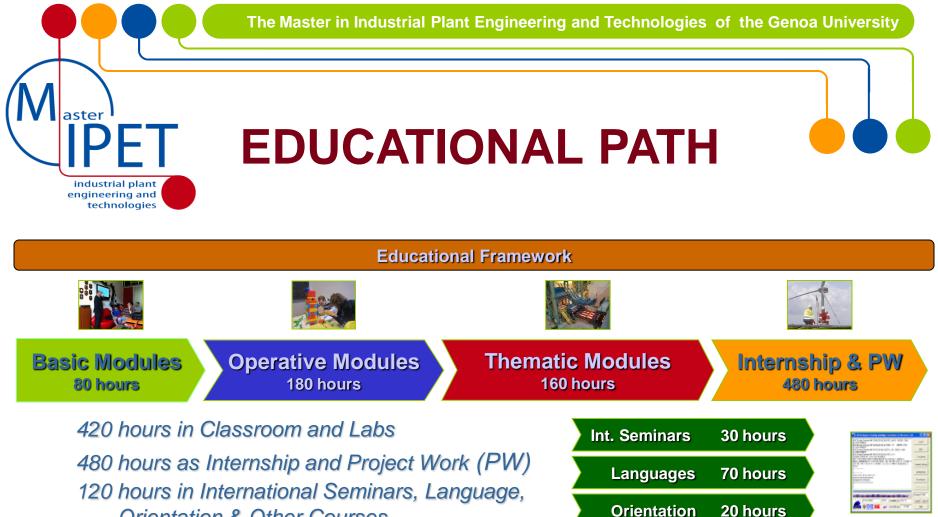


- Innovative Technologies, Techniques and Methodologies for Industrial Plants



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Orientation & Other Courses

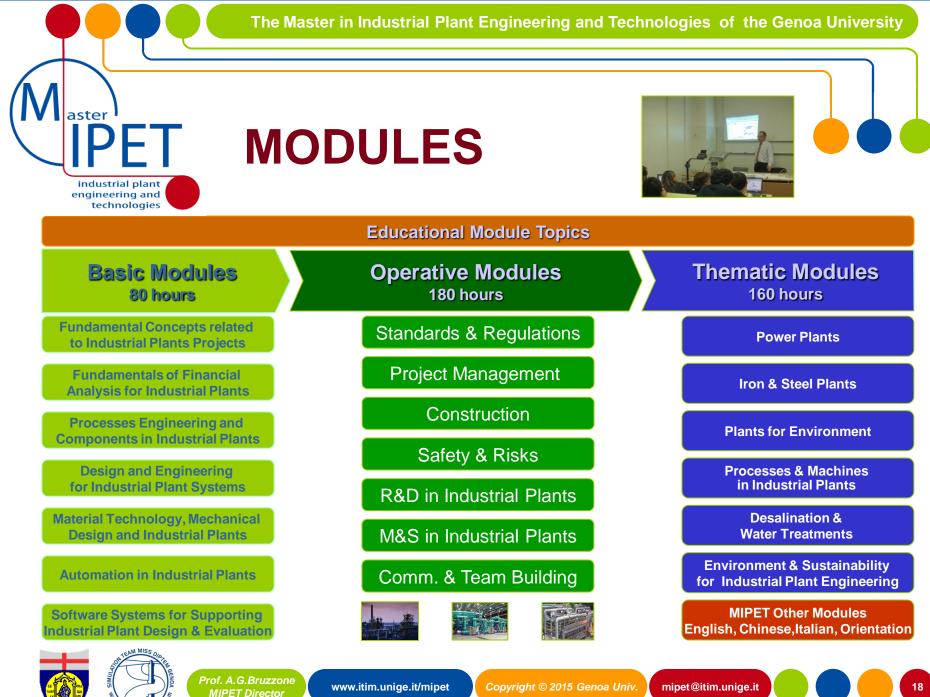
The Education framework of MIPET is focusing on industrial plant engineering and technologies by adopting different methods such as lectures, case study, exercises, common experiences, RPG (Role Play Games), simulations, use of models and software tools, interactive blended education (i.e. clickers), industrial plant guided visits and R&D\* Lab experiences



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\* R&D Research & Development





# Engineering Standards & Regulations





#### **Operative Module of MIPET**





Industrial Plant Engineering & Technologies

#### **Course Attendees**

**Engineering Standards & Regulations** is designed for young engineers, specialists and professionals active in Industrial Plants enabling them to make use of the state-ofthe-art norms, codes and standards for the design of equipment and systems.

#### **Objectives**

**Engineering Standards & Regulations** is devoted to organically present the existing and future norms to be adopted for the design and construction of Industrial plants; the course provides knowledge for supporting problem solving for companies facing for the first time regulations and codes in National and International industrial plant projects

## **Structure and Approach**

This modules is organized as a 36 hours course to be completed in 5 days by interactive sessions with experts coming from Industry and R&D. The approach includes lecturing, case studies, exercises, experiences, RPG, competitive and cooperative simulations



## industrial plant engineering and technologies

# Safety & Risk

#### **Operative Module of MIPET**





**Industrial Plant Engineering & Technologies** 

#### **Course Attendees**

**Safety and Risk Module** is designed for young engineers, technicians and professionals active in the engineering of Industrial Plants enabling them to deal with safety rules and risk analysis according to the state-of-the-art legislation.





#### **Objectives**

**Safety and Risk Module** is devoted to present methodologies, techniques and technologies related to safety and risk evaluation during design, construction and operation of an Industrial Plant.



## **Structure and Approach**

This modules is organized as a 36 hours course to be completed in 5 days by interactive sessions with experts coming from Industry and R&D. The approach includes lecturing, case studies, exercises, experiences, RPG, competitive and cooperative simulations



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#### **MIPET Operative Modules**

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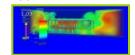
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# Standards & Regulations

- Large Industrial Plants: an Overview on Standards, Regulations and Administration Authorization Processes along Project Life Cycle
- Case Study on Impact of International Regulations on Industrial Plants with Special Attention to Directive 2006/42/CE, ATEX, PED.
- Quality Assurance and Control in Industrial Plants
- Quality, Safety and Environment Integrated Management in term of standards and regulations
- Environmental Impact Evaluation
- Introduction on Fire Safety and Explosion Risk for Industrial Plants. Risk Analysis for Fires and Explosions: methods, documents and classification
- Safety Concept. Innovative Engineering Solutions forn Fire and Explosions in Industrial Plants. Combination of Explosion/Fire Risks
- Fire Safety and Explosion Simulation
- Actions: organization, prevention, protection and mitigation solutions
- EXPLOSAD (Experience on Process Plant Safety Design): Case Study based on Simulation applied to fire and explosion protection applied to an industrial plant





## Safety & Risk



Facoltà di Ingegneria CONFINDUSTRIA Università degli Studi di Genova GENOVA



General Safety concepts related to Industrial Plants Life Cycle (accident pyramid, cause effect analysis, risk analysis, training and information, BBS, main indexes and matrixes, organization)

- Specific safety characteristics on Process Plants
- General Risks on Industrial Plants
- Methodologies and behavioral aspects related to safety and risks to be considered in plant design and construction
- Behavioral aspects influence on accident frequency
- Safety Design
- Quantitative and Qualitative methods to support risk evaluation and management
- · Introduction to integrated safety and risk evaluation systems
- Case Study on Safety Integrated Solutions
- Introduction to SBRA Methodology
- Exercise: application of SBRA (Scenario Based Risk Assessment) Methodology on a Construction Yard
- Case Study Resolution on the Construction and Debriefing on SBRA (Scenario Based Risk Assessment) application
- Introduction to Industrial Plant Service impact on Safety along Plant Life Cycle: Availability and indexes, Alternative Approaches, EOH, Impact of Engineering on Service and Safety, Service Inventory, Consistency and Optimization of Inspection and Revision Policies
- Service for Complex Industrial Plants

Each Operative Module includes a knowledge assessment and the attendees successfully completing each single Module receive a certificate from Genoa University. The Educational Material specific of the course is provided to each attendee



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#### **Operative Module of MIPET**





Industrial Plant Engineering & Technologies

#### **Objectives**

**Project Management Module** presents critical aspects related to Industrial Plant PM and provides basic concepts and methodologies in Project Management. The course provides knowledge for facing issues in Project Organization, Risk Management, Cost and Time Management, Planning & Control, Quality, HR and Communications

## **Course Attendees**

**Project Management Module** is designed for young engineers, technicians and professionals intended to operate as Project Engineers in complex Industrial Plants projects;

## **Structure and Approach**

This modules is organized as a 36 hours course to be completed in 5 days by interactive sessions with experts coming from Industry and R&D. The approach includes lecturing, case studies, exercises, experiences, RPG, competitive and cooperative simulations



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## Construction

#### **Operative Module of MIPET**





Industrial Plant Engineering & Technologies

#### **Course Attendees**

**Construction Module** is designed for young engineers, technicians and professionals active in Industrial Plants and dealing with Construction issues, enabling them to understand and make use of the key tools for the control and the management of the construction stage of an Industrial Plant.





#### **Objectives**

**Construction Module** presents critical aspects related to Constructions in Industrial Plant and provides basic concepts and case studies as methodologies. The course provides knowledge for facing issues in Site Management, Erection Planning, Cost and Time Control, Safety and Risks during erection and commissioning.

## **Structure and Approach**

This modules is organized as a 36 hours course to be completed in 5 days by interactive sessions with experts coming from Industry and R&D. The approach includes lecturing, case studies, exercises, experiences, RPG, competitive and cooperative simulations





#### **MIPET Operative Modules**

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## **Project Management**

- Project Management and specific issues related to Industrial Plants
- Project Life Cycles
- Reporting & Metrics for Project Management: PMB & KPIs
- Cost and Time Management, Techniques and Methodologies for supporting planning and control
- Risk Analysis & Risk Management: Risk Source Identification, Quantification, Decisional Trees, Statistical Methods and Simulation
- Communications: Technological Solutions, Information
   Distribution Policies
- HR in Project Management, organizational planning, People Management
- Quality Management: methods, constraints and critical issues in Industrial Plants
- Project Management Networks and Certification Processes
- Coordination Engineering, Purchasing, Erection, Commissioning
- PM Certification, Societies and International Overview
- Role Play Game: Celebes (Cooperative Engineering Plant, Project Business Exercise and Simulation), work to be completed by coordinated teams concurrently working on a complex industrial plant under coordination of real Project Managers and operating on a distributed simulation

#### Construction





- Construction of Industrial Plants
- Industrial Plant Construction from Project Start, Precommissioning, Commissioning, Closing
- Case Studies on Project Logistics in National International Frameworks
- Interaction between Engineering and Purchasing
- Case Study on Engineering Purchasing interactions
- Managing Construction Projects on Site
- Case Studies on Construction Yard Management
- Planning and Control on Site Construction
- Case Study on Construction Yard Activities
- Safety on Érections, Heavy Transport and Heavy Lifting during Construction
- Babel Experience: competition between two teams each one divided between Site and Office on a Construction Project; the experience is devoted to outline the critical issues related to coordination/cooperation between engineering and constructions as well as aspects related to communication, human resource management and project documentation





Each Operative Module includes a knowledge assessment and the attendees successfully completing each single Module receive a certificate from Genoa University. The Educational Material specific of the course is provided to each attendee



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The Master in Industrial Plant Engineering and Technologies of the Genoa University Master IPEET Innovation for Industrial Plant Undustrial plant Echnologies

#### **Operative Module of MIPET**





Industrial Plant Engineering & Technologies

## **Objectives**

Industrial Plant Innovation Module presents innovative methodologies, techniques, models presented by experts at international level able to guarantee a competitive advantage in Industrial Plant. addresses technical course both The and management issues in relation to different types of challenging problems in Sustainability, Oil and Gas, Smart Energy Management.

## **Course Attendees**

*Industrial Plant Innovation Module* is designed for young engineers, technicians and professionals intended to being updated on new Models and Innovative Methodologies to address complex Industrial Plants projects

## **Structure and Approach**

This modules is organized as a 36 hours course to be completed in 5 days by interactive sessions with experts coming from Industry and R&D. The approach includes lecturing, case studies, exercises, experiences, RPG, competitive and cooperative simulations



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**MIPET Director** 

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- Top Experts and Executives from Plant Industry
- Professional Experts from Institutes and Organizations

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Lecturing, driving Project Works, providing Case Studies, developing Class Exercises and offering Internships & Project Works.

MIPET includes experiences in up-to-date R&D Labs (e.g. Virtual Caves, Simulation, Combustion, Smart Grid) as well as visits to Industrial Plants tutored by Experts







This Master is coordinated by a Technical Scientific Committee composed by the following members:

- Agostino Bruzzone (Full Professor of Industrial Plants in DIME, MIPET Director)
- Matteo Agresta (Simulation Team University of Genoa)
- Giorgio Cannata (Professor of Automation, DIST)
- Micaela Caserza (MAILAB University of Genoa)
- Marco Del Borghi (Full Professor of Chemical Processes, DICHEP)
- Carla Gambaro (Professor of Technologies, DICHEP)
- Pietro Giribone (Full Professor Industrial Plants, DIME)
- Aleramo Lucifredi (Full Professor of Applied Mechanics, DIME)
- Andrea Reverberi (Professor of Chemical Processes, DICHEP)
- Luca Tagliafico (Full Professor of Thermo-Energy, DIME)
- Angela Taramasso (Professor of Civil Eng., DIST)
- Flavio Tonelli (Professor of Industrial Plants, DIME)
- Alberto Tremori (DIME University of Genoa)`

The Master Support Services are provided by: -Simulation Team, MITIM, DIME, Polytechnic School



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- Maurizio Barabino (ABB Italia)
- Giovanni De Marchi (Paul Wurth Italia)
- Cesare Laviosa (Danieli Centro Combustion)
- Carlo Raggio (Tenova)
- Enrico Gastaldo (Prisma Impianti)



- Alessandro Bongiovi` (ABB)
- Alessandro Donetti (Danieli Centro Combustion)
- Giorgio Migliorini (Fisia Italimpianti)
- Simonluca Poggi (Simulation Team)
- Massimo Romairone (Bombardier)
- Stefano Sadowski (Projenia)



## **BENEFITS FOR SPONSORS**

- Active role in selection processes of Master Candidates
- Opportunity for deep evaluation and selection of Master Attendees Selection, Educational Modules, Internship and Project Work
- Opportunities to improve the skills of Engineers & Technicians already employed
- Free Seats and Discounted Rates for registering into the Operative Modules
- Sharing High Quality Education Costs within a Specific Qualified Community
- Cultural Interaction among the different Actors of this initiative: Industrial Companies, University and Institutions
- Active Role free of cost into Student Meetings, Campus Interview and other Initiatives organized by MIPET
- Joint University-Industry stimulation of interest and research projects on subjects related to plant engineering.
- Development of a Fertile Background in Industrial Plant, Global Engineering and Construction devoted to enhance the competitiveness of the whole system.
- Visibility on Media and Promotional Initiatives



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## HOW A COMPANY BECOMES SPONSOR OF MIPET

- Subscribing an Agreement that includes an annual fee and the commitment to provide resources (i.e. 15 hours of experts for specific contributions to educational modules to be developed under Technical Scientific Committee Coordination).
- Providing information about its requirements and preferences with respect to the characteristics of Master Attendees to be selected.
- Getting Benefits of Free Seats and discounts on MIPET Operative Modules for its Employers and/or Customers
- Offering Internships to Master Program Students

Sponsors MIPET-6th Edition

PAUL WURTH

Prof. A.G.Bruzzone

**MIPET Director** 

Providing Expertise as well as Real Case Studies

DANIELI

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Excellence is the main goal of MIPET; in fact MIPET Partners are emphasizing following aspects:

- Strong commitment of all Partners in promoting MIPET at the National and the International level.
- International Approach in MIPET structure by involving teachers from foreign Excellence Centers and selecting engineers from other Countries.
- Introducing Innovative contents, especially through the Operative Modules, related to the Plant Engineering & Technologies.





- All Lectures and Material are in English
- Language Course for Attendees (English plus other optional Courses, i.e. Chinese)
- Agreements with Offices of Leading Companies for Cooperation and Enhancement of their top level engineers by involving them in MIPET Program
- Agreements with International Schools active in Plant Engineering and Technologies for Exchanging Trainers and Students
- Development of a Plant Engineering Reference Book for MIPET
- High Involvement of Foreign Students (e.g. India, Brazil, Iran)
- Special Benefits for Sponsors (i.e. Operative & Thematic Modules)



# ABB

# Leader in Energy and Automation

# **MIPET: ABB Power System Division**



# **DANIELI** CENTRO COMBUSTION



#### Paul Wurth

SMS Group

PAUL WURTH

#### Leading Player in Engineering and Construction



Technology and Innovation is our life insurance in a global market: portfolio of 224 patented inventions protected by 1584 active patents. 40 licensees. Recent orders in Brazil, Mexico, Germany,India, Japan, Korea, Russia, Taiwan.

PW: 26 entities in 18 countries, totalling about 1600 people, mostly holding a university degree. PW Italia, employing 208 people based in Genoa (99 hired in the last 5 years), is one of the Main group company with long tradition.

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# References

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