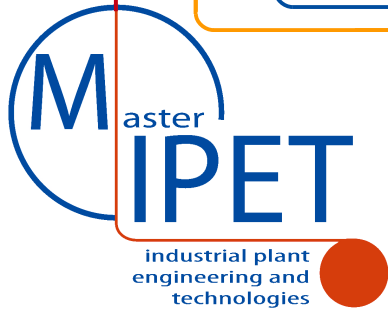


The Master in Industrial Plant Engineering and Technologies of the Genoa University



MIPET



Sponsors



WELCOME

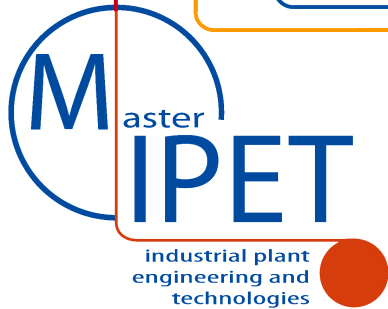


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CONFINDUSTRIA Genova



**CONFINDUSTRIA
Genova**
supports actively
the MIPET and
since beginning
and promotes this
initiatives among
the whole Industrial
Community



Ing. Guido Torrielli

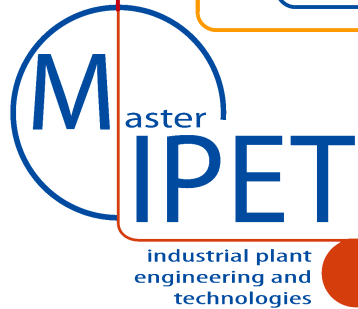


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Polytechnic School Genoa University

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.

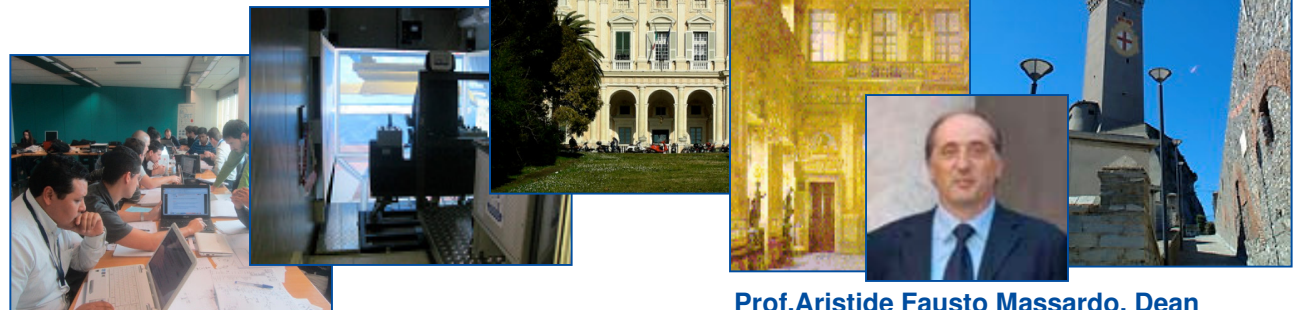
The students are about 40,000 (about 8,000 new entries), and the Engineering Departments involve around 7,500 students distributed among Genoa Locations and two External Sites: Savona Campus and La Spezia Area. Recently the Polytechnic School was established combining Engineering Faculty and Architecture 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.ingegneria.unige.it

www.itim.unige.it/mipet

www.unige.it



Prof. Aristide Fausto Massardo, Dean

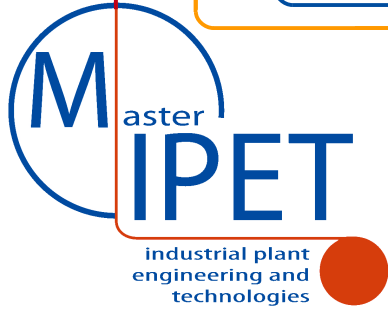


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Ordine degli Ingegneri della Provincia di Genova



The Professional Engineering Association is active in MIPET since the creation and guarantees the connection with the Community of Engineers



Ing. Riccardo Franchini

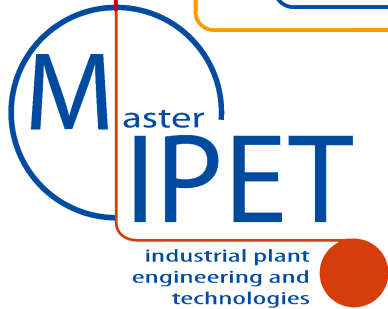


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PERFORM

Perform is the Centre of Genoa University devoted to promote Continuous Education, Professional Courses and Master Programs



Centro di Formazione Permanente

PerForm



Dott. Paolo Giannone

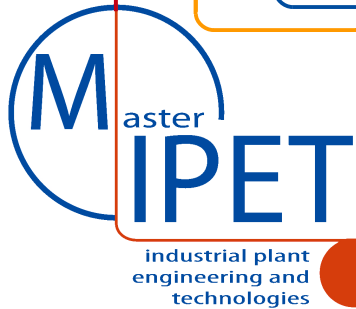


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Simulation Team at DIME University of Genoa



The Simulation Team at DIME of *Genoa University* carries out many industrial projects in cooperation with the large corporations and Small and Medium sized Enterprises; some example of recent industrial simulation project are following:

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MIPET President

ENI Group

Ford

LAMCE Petrobras

EDA

Fincantieri Group

**Fleet Management Planning & Scheduling
Chemical Plant Logistics Optimization**

**New Plant Facility Design for Far East
with Production Mix & Bypass Logic**

**Oil Platform Simulation
and Augmented Reality**

**Decision Support for
Country Reconstruction Activity Planning**

**Simulation for Life Cycle Assessment
of New Vessels**



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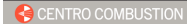
industrial plant
engineering and
technologies

MIPET



Mastering Industrial Plant Engineering and Technologies is an initiative promoted by a joint Team of Academic Institutions, Industries and Associations. MIPET includes an International Master focused on Industrial Plants Technical Issues, with special attention to Engineering. MIPET Master Program Excellence is based on the 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.

Sponsors

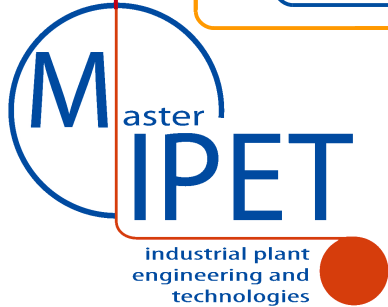


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Academia, Institutions & Industries

MIPET ORGANIZERS & SUPPORTING INSTITUTIONS



SPONSOR COMPANIES

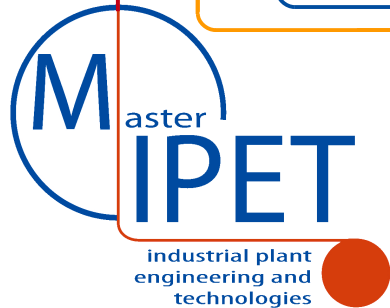


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WHAT IS

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

The Master Program is directed by the Polytechnic School - Faculty of Engineering in close cooperation with industrial partners which represent some of the best reputed global players in the Engineering and Construction market. The main goal of the Master is to meet the requirements of such industrial partners in terms of professional skills and technological competencies.

As a matter of fact, this project it is part of a larger program devoted to develop synergies among Engineering Departments of Genoa University and the top level Engineering & Construction companies to pursue the goal of excellence in processes and products through a continuous enhancement of their Competitive Assets: Technology, Human Capital, Know How, R&D* and Skills.



* R&D Research and Development



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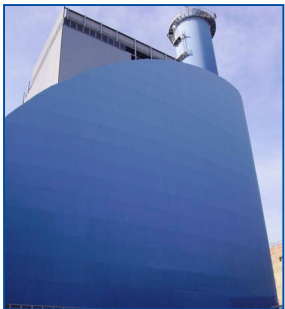
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INTELLECTUAL CAPITAL FOR FUTURE OF ENGINEERING

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 Prize 1921, Princeton University)

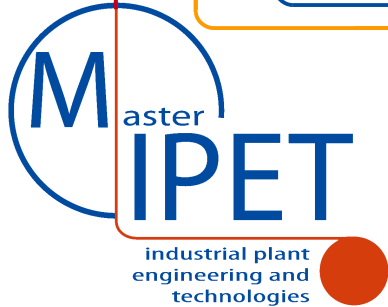


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MASTER OUTCOME

The Master is devoted to create System and Process Engineers, Technical Coordinators operating effectively in Project Teams in Global Engineering and Construction. The Master 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 and Commissioning. At Master Program completion, the students have developed 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 a particular industrial sector (i.e. Power, Iron & Steel) as well as with Internship Experiences in Companies.

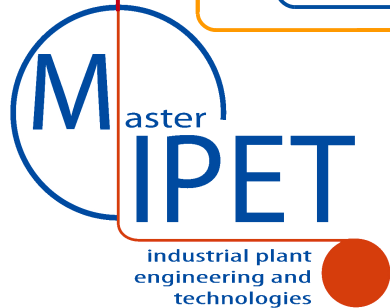


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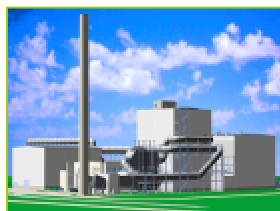
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WHO SHOULD ATTEND

- Young Engineers with strong potential and technical background
- International Excellent Students of Engineering Departments from all around the world
- Engineers with experience in Plant Engineering from world-wide
- Engineers already employed in Engineering and Construction Companies who are interested in attending specific Operative Modules of the Master Program such as Project Management, Constructions, Standards and Regulations, Safety, Security & Risks

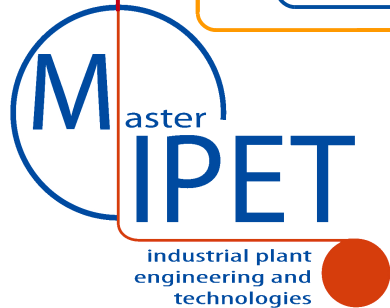


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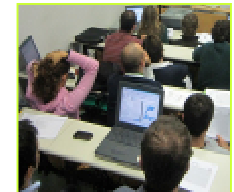
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MIPET ADDED VALUE

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.

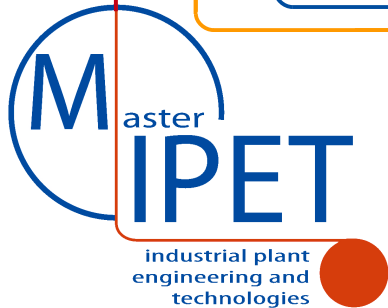


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INVESTEMENTS & SELECTION



- The Master is based on a agreement among the Sponsoring Companies and Genoa University. In fact MIPET Industrial Sponsors financed extensively the past editions (100% in 2010/2011 and 85% in 2011/2012), 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 Process is based on a mixed team of Technical and Human Resources Experts from Academia and Industry able to select candidates with very high potential (e.g. in 2010, 120 applications, 60 selected interviews, 15 selected master attendees)
- The MIPET Tuition Fee is 7'500.00 Euro (two payments: 1'500.00 prepayment and 6'000.00 after 4 months); therefore Selected Candidates receive a 6'000.00 grant Euro from Companies and/or Governmental Institutions and have to pay only 1'500.00 Euro for being enrolled after selection procedure completion (no extra payment required to students)
- In Last MIPET Edition 100% of the Students achieving the Master Degree obtained full 100% coverage of Tuition Fees
- MIPET is establishing agreements with major University around the World for promoting this initiative and cooperation in Industrial Plant Engineering & Technologies

* ROI Return of Investments



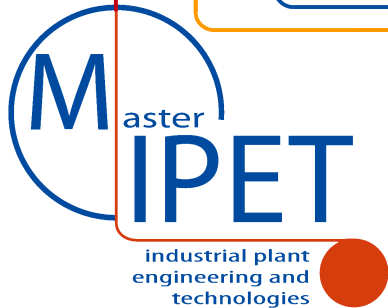
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GRANTS & PLACEMENT

- All the Sponsor Companies are interested and committed to evaluate the best MIPET students (able to complete successfully the Program) 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
- The job placement is very good both in terms of numbers and quality; placement statistics confirm that more than 80% of the previous Master Students were hired by leading industries, excellence centers and major companies operating in industrial plant sector
- Master Students and Companies have the opportunities to know each other during the Internship & Project Work for improving the placement opportunities
- MIPET organizes periodic group and individual meetings among Sponsor Companies and MIPET Students, as well as orientation meetings, in order to finalize internship and cooperation agreements



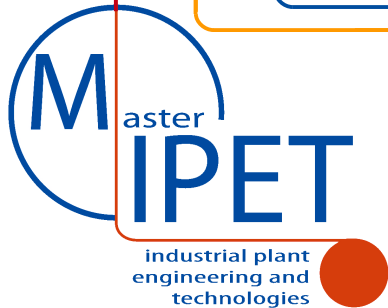
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GENERAL PROGRAM



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.



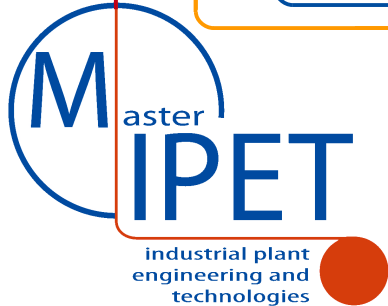
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OPERATIVE MODULES

Operative Modules are compact and specific courses (3-5 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 possibility to 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**
- **R&D in Industrial Plants**
- **Modeling & Simulation for Industrial Plants**
- **Communication and Team Building**



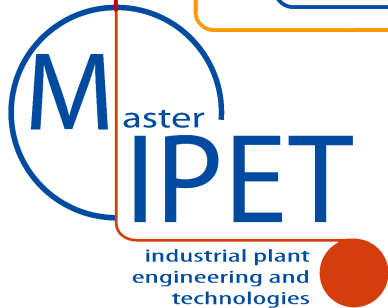
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EDUCATIONAL PATH

Educational Framework



Basic Modules
~80 hours



Operative Modules
~180 hours



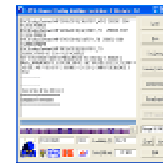
Thematic Modules
~160 hours



Internship
~400 hours

420 hours as Classroom Lectures

400 hours as Project Work



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

* R&D Research & Development

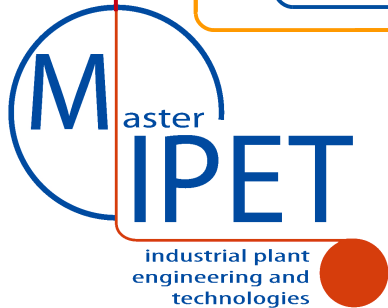


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MODULES



Educational Module Topics

Basic Modules

80 hours

Fundamental Concepts related to Industrial Plants Projects

Fundamentals of Financial Analysis for Industrial Plants

Processes Engineering and Components in Industrial Plants

Design and Engineering for Industrial Plant Systems

Material Technology, Mechanical Design and Industrial Plants

Automation in Industrial Plants

Software Systems for Supporting Industrial Plant Design & Evaluation

Operative Modules

180 hours

Standards & Regulations

Project Management

Construction

Safety & Risks

R&D in Industrial Plants

M&S for Industrial Plants

Comm. & Team Building



Thematic Modules

160 hours

Power Plants

Iron & Steel Plants

Plants for Environment

Processes & Machines in Industrial Plants

Desalination & Water Treatments

Environment & Sustainability for Industrial Plant Engineering

MIPET Other Modules
English, Chinese, Italian, Orientation

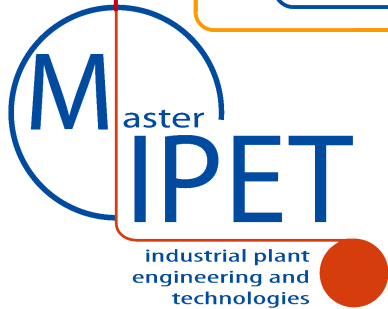


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Engineering Standards & Regulations



Operative Module of MIPET

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PAUL WURTH

PRISMA Impianti

tenova



Industrial Plant Engineering & Technologies

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

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-of-the-art norms, codes and standards for the design of equipment and systems.

Structure and Approach

This module is organized as a 35 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



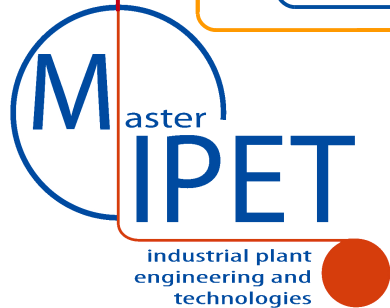
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Safety & Risk



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Industrial Plant Engineering & Technologies

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.

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.

Structure and Approach

This module is organized as a 35 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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Master IPET

industrial plant engineering and technologies

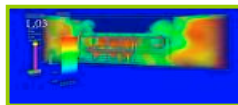
MIPET Operative Modules

Standards & Regulations

Safety & Risk



- 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 for 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



- 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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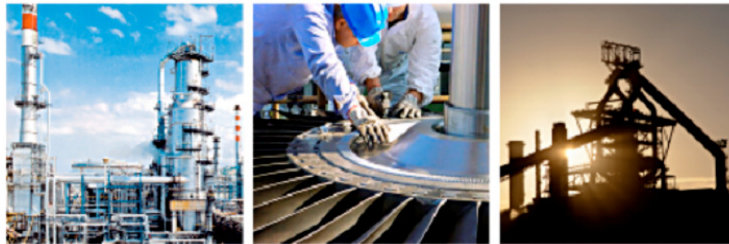
industrial plant
engineering and
technologies

Project Management



Operative Module of MIPET

Sponsors



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 module is organized as a 35 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



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Industrial Plant Engineering & Technologies

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.

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.

Structure and Approach

This modules is organized as a 35 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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industrial plant engineering and technologies



MIPET Operative Modules

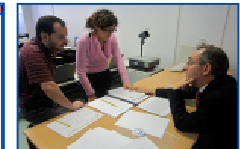
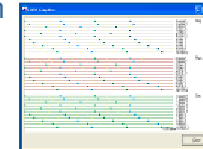
Project Management

Construction



- 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 of Industrial Plants
- Industrial Plant Construction from Project Start, Pre Commissioning, 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 Erections, 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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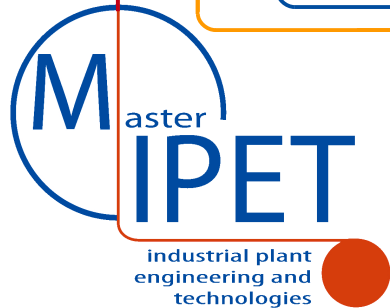


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R&D for Industrial Plant



Operative Module of MIPET

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Industrial Plant Engineering & Technologies

Course Attendees

R&D in Industrial Plants is designed for young engineers, technicians and professionals active in Industrial Plants and dealing with Research Projects, enabling them to prepare proposals and manage R&D issues in relation to Plant Projects and with an Industrial Organization in this sector

Objectives

R&D in Industrial Plants Module presents critical aspects related to the acquisition, management and integration of R&D activities and Projects in Industrial Plant sector presenting both basic concepts as well as case studies. The course addresses several issues in R&D within this sector including Proposal Management, Cost and Time Control, Intellectual Proprietary Rights, Networking

Structure and Approach

This module is organized as a 14 hours course to be completed in two days by interactive sessions with experts coming from Industry, Academia and R&D. The approach includes lecturing, case studies, experiences, lesson learned and project examples



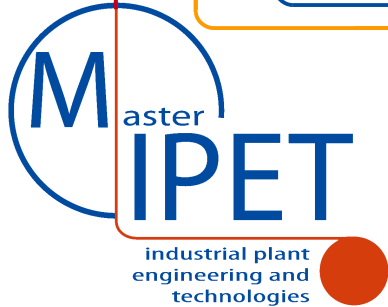
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26



Modeling & Simulation for Industrial Plants



Operative Module of MIPET

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Industrial Plant Engineering & Technologies

Objectives

M&S for Industrial Plants Module is focused on presenting basic concepts as well as advances in Simulation of Industrial Plants; the goal is to transfer the capability to identify competitive advantages for using M&S, to define Simulation requirements and to validate, verify the model and to analyze the virtual experimental results.

Course Attendees

Modeling & Simulation (M&S) in Industrial Plants is designed for young engineers, technicians and professionals active in Industrial Plants interested in applying, within Industrial Projects, Simulation Techniques as effective support for: design & engineering, virtual prototyping, training or P&P¹ definition

Structure and Approach

This module is organized as a 15 hours course to be completed in 2 days by interactive sessions with experts coming from Industry and R&D. The approach includes lecturing, case studies, simulation execution, experiences, RPG, competitive and cooperative simulations

¹P&P Policies and Procedures

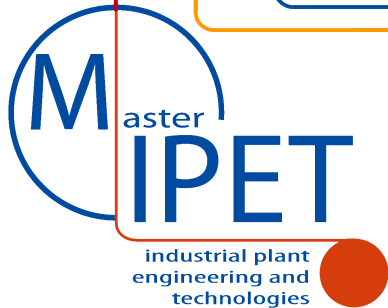


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Communication & Team Building



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Industrial Plant Engineering & Technologies

Objectives

Communication and Team Building Module is focused on proposing basic techniques and methodologies to address the Communication and Team Building issues; the goal is to experience such methodologies during the class and to transfer knowledge about techniques and methodologies within these sectors

Course Attendees

Communication and Team Building Module is designed for young engineers, technicians and professionals active in Industrial Plants interested in developing communication skills and knowledge of team building techniques.

Structure and Approach

This module is organized as a 7 hours course to be completed in 1 day by interactive sessions with experts. The approach includes presentation, team exercises, case studies, experiences, RPG, competitive and cooperative simulations



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MIPET Operative Modules



R&D

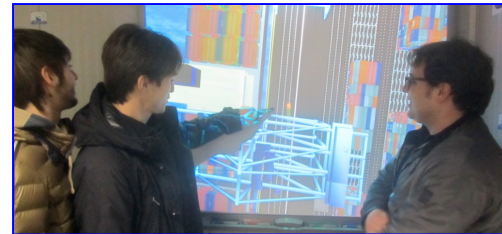
M&S

Communications

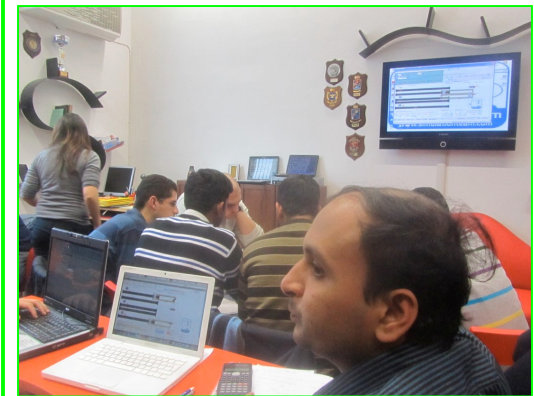
- Research and Development for Industrial Plants
- Networking & Partnership for R&D
- Proposal Management and Reporting in Research Projects
- Intellectual Proprietary Rights in R&D
- Risk Analysis in R&D for Industrial Plant Projects
- Case Study: European Union Project
 - R&D in Industrial Plants and Competitiveness
- Case Study: applying Innovative Techniques for Sustainability in Industrial Plants
- Exploiting R&D Results



- Simulation for Industrial Plants
- Comparison between Simulators for training and simulators for design and development
- Requirements for M&S in Industrial Plants
- Verification and Validation
- Simulation Execution and Experimental Analysis
- Experience on a Simulator: Process Simulation in Iron and Steel Plant
- Operational Training Simulators
- Case Study: System Simulation in Iron and Steel Plants
- Models for Analysis in Large Plants



- Communication in Organizations and Industries
- Communication Skills
- Communication Channels
- Relationships
- Public Speaking
- Team Building
- Interpersonal - Leadership
- Lateral Thinking
- People Management Basics



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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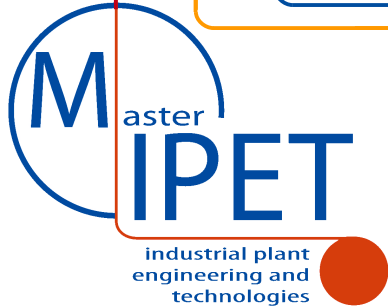
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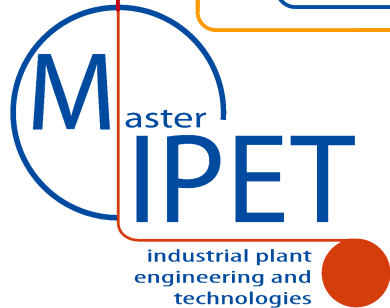


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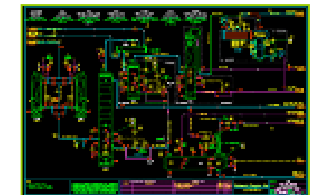


ORGANIZATION



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

- **Agostino Bruzzone** (Full Professor of Industrial Plants in DIME, MIPET President)
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- **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)
- **Francesca Madeo** (Simulation Team - University of Genoa)
- **Andrea Reverberi** (Professor of Chemical Processes, DICHEP)
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- Simulation Team MISS DIPTTEM University of Genoa



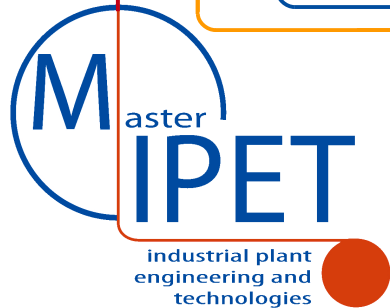
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- Sharing High Quality Education Costs within a Specific Qualified Community
- Cultural Interaction among the different Actors of this initiative: Industrial Companies, University and Local Institutions.
- Joint University-Industry stimulation of interest 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.

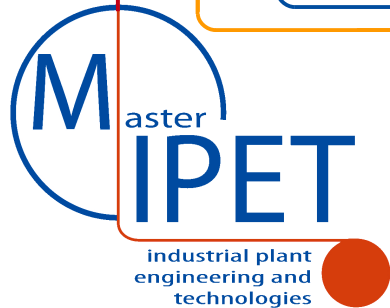


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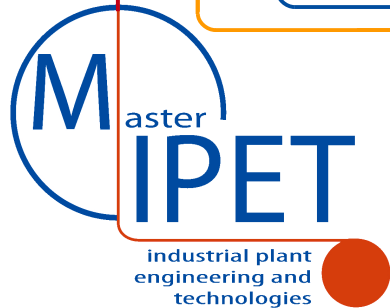


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Excellence is the main goal of MIPET; in fact MIPET Partners agreed to strengthen the following aspects:

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

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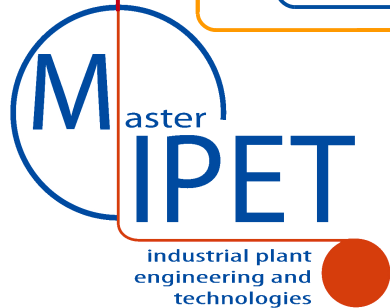


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MIPET FEATURES



TO STEP FORWARD

The ongoing cooperation among partners and sponsors aims at continuous improvement by introducing and develop new features able to keep MIPET to top quality level:

- Language Courses for Attendees (in addition to English other optional Courses: i.e. Chinese)
- Agreements with Branch Offices of Leading Companies for Enhancing 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
- Important Involvement of Foreign Students (i.e. India, Brazil, Iran)
- Special Benefits for Sponsors (i.e. Operative & Thematic Modules)
- Development of a Plant Engineering Reference Book for MIPET



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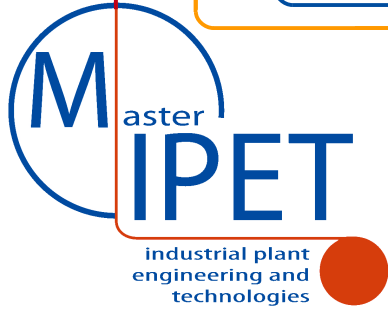


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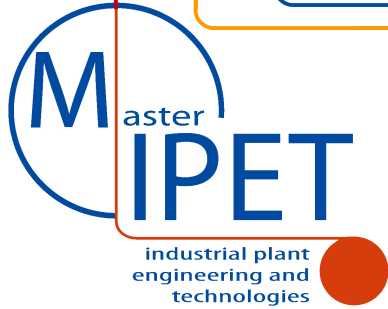


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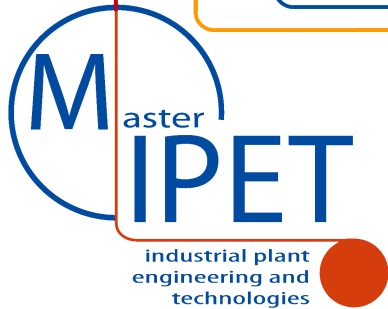


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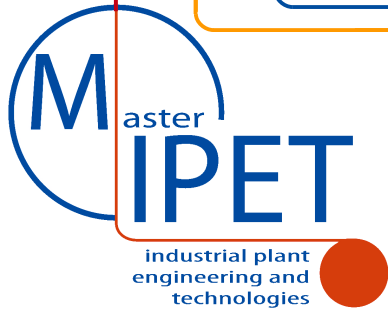
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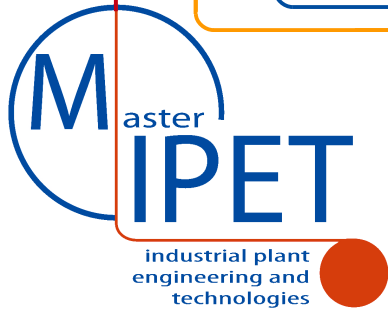


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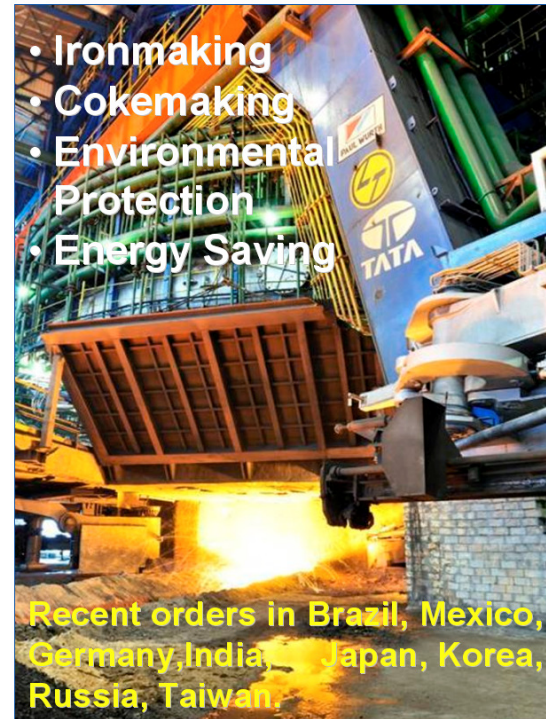
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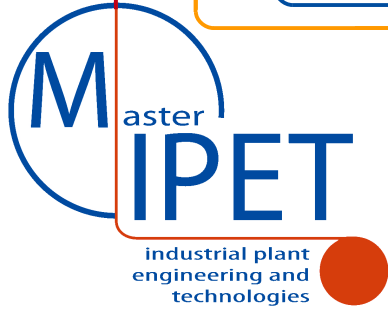


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