

MIPET











Mastering Industrial Plant Engineering & Technologies







This initiative is focused on Industrial Plant Engineering & Technical Issues. MIPET is a Master Program based on strong cooperation among Academic and Technical Experts coming from Leading Universities and Companies and operating in this area; special focus is dedicated to Engineering, Construction, Powering, Iron & Steel, Environment and Process Plants. MIPET-4th is the fourth edition of the International Master MIPET (2013).

Sponsors



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Academia, Institutions & Industries

MIPET ORGANIZERS & SUPPORTING INSTITUTIONS

















SPONSOR COMPANIES



















Edition 2011//2012

















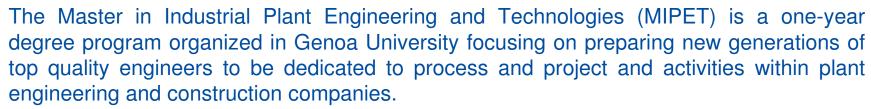








WHAT IS



The Master Program is directed by the Faculty of Engineering 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 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 exploit the synergy between the Genoa University Engineering Faculty 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 and skills.







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



industrial plant engineering and technologies















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















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 phase: Proposal, Detailed Engineering, Procurement, Manufacturing, Erection 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 Equipment, Iron & Steel) as well as with Internship Experiences in Companies.















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































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.













EPC Engineering, Procurement & Construction







MIPET FRAMEWORK



Students



- Experience: the Class includes both new Graduates and Young Engineers (50% New Graduates and 50% Engineers with 1-3 years of working experience)
- Technical Background: 90% Engineering (Mechanical Eng. 45%, Chemical Eng. 10%, Naval Eng. 10%, Automation Eng. 10%, etc.), 10% Science (i.e. Chemistry, Physics)
- All Classes in English plus Courses in Languages (i.e. English, Italian, Chinese)
- Selected based on Curriculum Vitae, Technical and Potential Evaluation by Interview

Faculty & Companies



- Educational Activities are delivered by University Professors and Experts from Companies Lectures are shared 50%, while Exercises, RPG and Simulations are carried out usually in ioint cooperation
- Teaching involves University Professors related to all Engineering Areas related to Industrial Plant Engineering & Technologies from Genoa and other prestigious Universities
- Industry includes both E&C and EPC Companies as well as Large Companies & SME (Small and Medium Size Enterprises)
- Internship are carried out in Industry (Sponsor Companies 85%, other Partners 15%)

Data Related to MIPET 2011/2012 edition



Prof. A.G.Bruzzone MIPET Director

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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 <u>all Selected Candidates receive a 6'000.00 grant Euro from Companies and/or Governmental Institutions</u> 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











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 and major companies operating in industrial 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 between Sponsor Companies and MIPET Students, as well as orientation meetings, in order to finalize internship and

cooperation agreements

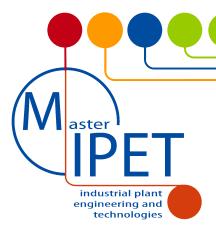












GENERAL PROGRAM





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.
- Other Modules devoted to improve cultural background (i.e. Languages English, Chinese, Italian)

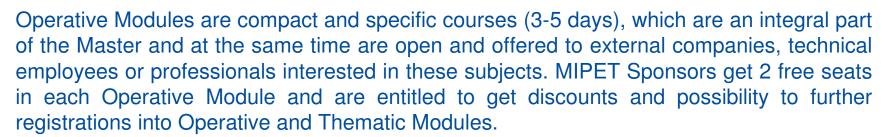








OPERATIVE MODULES



These modules are carried out jointly by the Industry and the Academy and are 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
- Industrial Plants













EDUCATIONAL PATH



Educational Framework









Basic Modules ~80 hours

Operative Modules
~160 hours

Thematic Modules

Internship ~400 hours

- ~420 hours as Classroom Lectures
- ~400 hours in Internship / Project Work



- ~100 hours of Other Modules
- ~780 hours for Individual Study & Thesis

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















MODULES









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** ~160 hours

Standards & Regulations

Project Management

Construction

Safety & Risks

Industrial Plant



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, 2nd Language, Orientation















Engineering Standards & Regulations













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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 codes **National** and in 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-ofthe-art norms, codes and standards for the design of equipment and systems.

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







Prof. A.G.Bruzzone MIPET Director

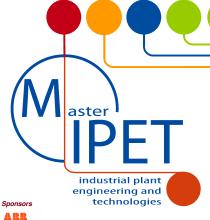












Safety & Risk













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BOMBARDIEF

Operative Module of MIPET







Industrial Plant Engineering & Technologies

Objectives

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

Course Attendees

Safety and Risk Module is designed for technicians engineers. young 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 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







Prof. A.G.Bruzzone **MIPET Director**













MIPET Operative Modules

Standards & Safety & Regulations Risk













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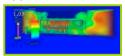
PAUL WURTH PRISMA





• 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





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















Project Management













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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 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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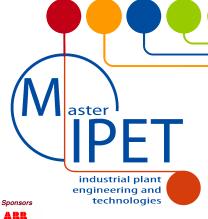
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Construction













BOMBARDIEF













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

Operative Module of MIPET

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 phase 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







Prof. A.G.Bruzzone MIPET Director











MIPET Operative Modules



Project Management

Construction









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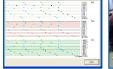


Project Life Cycles

- 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, 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













MASTER: FACULTY & LABS



- Genoa University Professors
- Italian Top-Quality University Faculty
- International Teachers and Experts
- Company Experts
- Professional Experts from Institutes and Organizations



All the Sponsor Companies of this Master Program have the possibility of being actively involved in Lecturing, driving Project Works, providing Case Studies, developing Class Exercises and offering Internships & Project Works.











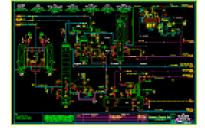
ORGANIZATION



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

- Agostino Bruzzone (Full Professor of Industrial Plants in DIME, MIPET Director)
- 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)
- Francesca Madeo (Simulation Team University of Genoa)
- 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 (Simulation Team University of Genoa)

- Maurizio Barabino (ABB Italia)
- Pier Luigi Biancheri (PMS)
- Alessandro Donetti (Danieli Centro Combustion)
- Piergiorgio Fontana (Paul Wurth Italia)
- Enrico Gastaldo (Prisma Impianti)
- Giorgio Migliorini (Fisia Italimpianti)
- Carlo Raggio (Tenova)
- Massimo Romairone (Bombardier)
- Stefano Sadowski (Projenia)



The Master Support Services are provided by:

- -PERFORM Service for Continuous and Professional Education, Genoa University
- -Simulation Team MISS DIPTEM University of Genoa













COMPANY ROLES



MIPET have different opportunities to involve Companies as Sponsors, Partners in different forms with specific roles and benefits:

Sponsor Companies

- Involved in MIPET Management, Selection, Lecturing, Evaluation, Internship and Project Work
- High Visibility and involvement on MIPET Media Actions (i.e. Web Site, Newspapers, Magazines, Search Engines) and MIPET events (i.e. Meeting, Workshops)
- Free Seats in each Operative and Thematic Modules for their Employers

Partners Companies

- Involved in MIPET Lecturing, Internship and Project Work
- Visibility and involvement on MIPET Media Actions (i.e. Web Site, Newspapers, Magazines, Search Engines) and MIPET events (i.e. Meeting, Workshops)
- Free Seats in Operative and Thematic Modules for their Employers

Please Contact mipet@itim.unige.it for further information on partnership opportunities











SPONSOR COMPANIES











BENEFITS FOR SPONSORS

- Active role in selection processes of MIPET Candidates
- Active role in MIPET Program refining
- Opportunity for deep evaluation and selection of Master Attendees during 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 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.















MIPET & INDUSTRIES











HOW A COMPANY ACTVIATE MIPET PARTNERSHIP

- 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.
- Registering its employees to specific Operative Modules
- Offering Internships to Master Program Students
- Providing Expertise as well as Real Case Studies









Impianti



































MIPET STRONGHOLDS











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 foreign Excellence Centers and selecting engineers from other Countries.
- Introducing new contents, especially through the Operative Modules, related to the Plant Engineering & Technologies.

Sponsors2011/2012













































MIPET FEATURES











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:

- All Lectures and Material are in English
- Language Course for Attendees (English plus other 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
- Development of a Plant Engineering Reference Book for MIPET
- High Involvement of Foreign Students (i.e. India, Brazil)
- **Special Benefits for Sponsors (i.e. Operative & Thematic Modules)**
- Additional Companies are providing free Lectures and/or Internships

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Companies providing Free Lectures and/or Internship in 2011/2012















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References

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Ing.Francesco Madeo













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PMS

















