

# MASTER OF SCIENCE IN CHEMICAL ENGINEERING FOR THE SUSTAINABLE DEVELOPMENT

## ECONOMICS AND BUSINESS MANAGEMENT

SSD ING-IND/35, 6 CFU

### Objectives

#### KNOWLEDGE AND COMPREHENSION ABILITY

The lectures are aimed at providing the basic knowledge of Economics and Management needed to proactively afford the world of the Projects, of the Enterprises, of the Markets: Competition, Enterprises and Corporations, Corporate Communication Tools, Organizations and Models, Financing, Business Plans.

Project Management, Project Control, Risk Management, Elements of Financial Mathematics

#### APPLICATION ABILITY

Once passed the final examination the student can afford the world of the Enterprises, with particular focus on the PBE (Projects Based Enterprise) ,and will be familiar with the disciplines regarding the management of the projects :

Project Finance

Project Management

Estimating

Budgeting

Project Control

Project Risk Management

He will also be capable to identify the key factors of the Enterprise Value Creation, and understand the relevant KPI (Key Performance Indicators)

His applicative knowledge will involve the Yearly Financial Statements of the Enterprise, and will put him in the conditions of participating also in teams preparing Feasibility Studies and Industrial Plans.

#### AUTONOMY OF JUDGEMENT

Between the basic objectives of this course the stimulation and widening of the cultural vision is one of the most important : the student is driven towards the ability to correlate the technical aspects with the economic and applicative ones, so that he can obtain a deeper consciousness of the total context , and definitely a much wider autonomy of judgement.

#### COMMUNICATION SKILLS

The improvement of the communication skill is pursued by continuously encouraging the discussion and the public speaking, including the active participation of the students in the presentation of several themes of the lectures.

#### LEARNING SKILLS

The "learning" , activated by focusing on the curiosity of the students about the world of the global economy, of the entrepreneurship, of the finance , is reflected in the concrete finalization of the guided exercises, during which the learning and comprehension by the students are continuously tested and challenged.

### Prerequisites

None

### Contents

The Companies:

- Enterprises, Market, Economic Balance, Industrial Companies: “project based” Company; Stakeholders and tools of communication; Shareholders; Governance. Organization Principles and models.
- Elements of Financial Mathematics.
- Enterprise analysis: processes, products, market, organization; economic and financial analysis. Evaluation of enterprises: economic criteria, comparative criteria, financial criteria.
- Start up and Spin off . Acquisition, Merger and Demerger.
- Responsibility of the enterprises. Ethical code, Monitoring Authority, Social Responsibility. Sustainability.
- Structures of financing for projects and enterprises. Project Financing.
- Business plan.
- International competition. National and International Contracting. Structures of the contracts. Risks, mitigations and recourse ( guarantees ). Partnership between companies. Disputes.

The Projects:

- Overview and basic concepts.
- Risk analysis/assessment and risk management.
- Project Management. Project Control. Construction Management. Crisis Management.
- Preliminary evaluations, “information memorandum”, evaluation criteria for the cost of the projects, cost of materials, cost of construction, cost of products and utilities, cost of services, amortization, cash flow analysis, selection criteria. Planning and Scheduling.

The Chemical Engineer:

- Main characteristics of the industrial scenarios, professional courses. “Experts” and “Managers”. The team work.
- Case study: analytic evaluation of the cost of a chemical or petrochemical establishment.

## Teaching Methods

As approved by the Academic Senate (8 July 2015, n. 193), the lectures will be in english language. Lectures about the topics of the course and tutorials showing their applications (in particular, about the methods for estimating the cost of a Process Plant).

Notes and slides will be published on the dedicated section of the e-learning platform.

## Verification of learning

The learning will be assessed via a written test followed by a discussion. The written test, for an overall length of about 2 hours, is represented by a "multiple answer quiz", with 10 questions, out of which at least one is an economic/financial problem referred to an industrial context. For every subject correctly answered the score is equal to 2/30.

The oral test, for an overall length of about 30' involves 2 questions referred to the course program, out of which one is chosen by the student. For every subject discussed in exhaustive terms a maximum score of 5/30 will be granted.

The final vote of the exam, expressed as a grade of out of 30, is represented by the total of the grade of the written test and of the oral one. An exam is deemed to be passed successfully if the final grade is equal to or higher than 18/30.

In the event of a full grade (30/30) the student will have the opportunity to try to grant honors (lode) through the discussion of an additional subject.

The result of the exam will be duly registered on both a paper and an electronic record-book.

## **Texts**

Teacher Handouts

- Valle-Riestra F.J., Project Evaluation in the Chemical -Process Industries, McGraw-Hill.
- La Bella A., Battistoni E., Economia ed Organizzazione Aziendale, APOGEO.

Additionally:

- Mintzberg H., Mintzberg on Management, The Free Press NY.
- Imperatori G., Il Project Financing, Ed. Il Sole 24 Ore.
- Balestri G., Il Bilancio di Esercizio, Ed. HOEPLI.
- Mankiw, Taylor, Ashwin PRINCIPI DI ECONOMIA PER L'IMPRESA, Ed. Zanichelli