Master of Advanced Studies
Industrial Engineering and Operations
Fast way to work in excellent companies
MASIEO
Edition 2014 -15
University of Applied Sciences and Arts of Southern Switzerland
SUPSI
in partnership with
COREP
RAMSE

COURSE CONTENTS

Id			Hrs	Cum. hrs
INTRODUCTORY MODULES				
1	**Introduction to MAS in Industrial Engineering and Operations**	(This part will be included to the following module # 15)	**4**	**4**
2	**Business Process Management (3 ECTS)**	• Global vision of evolution of operations • Role of Manufacturing, Design, Maintenance, Supply Chain, Controlling and Design for Quality, Safety/Health/Environment • Organisation systems: functional and operative logics • Production systems: types and characteristics • Identification of processes to be analysed • Definition of process limits: for suppliers and customers • Definition of inputs and outputs from the different players • Definition of tasks and connected procedures • Time analyses of tasks • Definition of expected performances (performance indicators) • Definition of responsibilities about processes • Statistical analyses of performed processes	**36**	**40**
3	**Plant Design (4 ECTS)**	Fundamentals of facilities, equipment and technical drafting • Facilities, equipment, DCS and SCADA systems, data collection on process and state of equipment • Industrial design • Using AUTOCAD Suite (Carpentry, P&Id, AF&Id)	**48**	**88**

4	**Risk Factors and Safety, Health and Environment Legislation and Management Systems (6 ECTS)**	Chemical, Physical and Biological Risks • Chemical, biological and radioactive substances • Noise and vibration • Powders Fire fighting Safety requirements • Base concepts, techniques of analysis and measurement, reference standards • Machinery Directive • LV and EMC Directives • ATEX Directive • PED Directive • Seveso Directive • Dangerous substances (REACH, CLP, ADR, RID) Sustainability and Environment • Base concepts on Sustainability • Waste treatments (solids, liquids, gaseous)	**72**	**160**
5	**Tools for Risk Assessment and RAMS Analysis (5 ECTS)**	Risk analysis techniques for reliability, availability, and maintainability of the system • Introduction to risk analysis, perception and acceptability, analysis structure, identification of hazards, FMECA, HAZOP, HAZID • Analysis of accident sequences, event trees, impact analysis, predictive method • Failure Tree Analysis, Reliability Block Scheme, Criticality Indexes Reliability databases • Analysis of commercial reliability databases Advanced Techniques • Monte Carlo RAMS and Contracts • RAMS requirements in supply contracts: legal factors, practical examples Human Factors • Methodologies for Human Factors studies	**60**	**220**
6	**Statistics and Quality Management (5 ECTS)**	Statistics and Data Analysis • Elements of statistics, data analysis and applications in reliability Introduction to Quality • Quality Management System • Quality costs • Purchasing management • Quality house Lean six sigma • Lean base concepts and main tools (business game) • Lean design • Lean supply chain • Lean techniques for service companies • Implementation of lean approach • Base concepts of six sigma approach • Six sigma for service companies • Design for six sigma	**60**	**280**

7	**Industrial Accounting (2 ECTS)**	• Fundamental of industrial accounting • Maintenance budgeting and Analysis of Investments • Cost Analysis	**24**	**304**
8	**Human Resources Management (2 ECTS)**	• Company Organisation System • Personnel Management • Professional Communication • Leadership and team working • Performance Management • Management Tools	**24**	**328**
9	**Project Management (4 ECTS)**	Introduction to Project Management • Time • Cost • Human Resources • Risk • Quality • Procurement • Communication • Professional Responsibility • PMI CAPM™ test simulation	**48**	**376**

THEMATIC MODULES				
10	**Industrial Maintenance Management (4 ECTS)**	Maintenance Integrated System Work management and outsourcing contracts Management of spare parts and technical materials Reliability Cantered Maintenance (RCM) and Risk Based Inspection (RBI)	**48**	**424**
11	**Industrial Energy Management (2 ECTS)**	Energy saving in industrial activities • Energy systems and self-production • Electrical Systems for Energy • Rules for energy markets • Energy Technologies • Technical knowledge in the field of energy systems, renewable energy and energy efficiency	**24**	**448**
12	**Facility Management (3 ECTS)**	Facility Management competences Facility maintenance and refurbishment operations	**36**	**484**
13	**Operations Management (3 ECTS)**	Manufacturing organisation • MTO (Make-to-Order), ATO (Assembly-to-Order), MTS (Make-to-Stock) Manufacturing systems • Production line • Process production • Production cells • Project production Design of layout • Human factors • Methods and Time Analysis • Layout techniques Production planning (PUSH): • Industrial and Commercial Plan • MPS (Master Production Scheduling) • MRP I (Material Requirement Planning) • MRP II (Manufacturing Resourse Planning) • CRP (Capacity Requirement Planning) Just-In-Time (JIT) e Kanban (PULL) Mixed systems (PUSH and PULL): • CONWIP • DSSPL • VIHPS • HIHPS Base scheduling Using of simulation programs	**36**	**520**

14	**Risk Management, Business Continuity and Disaster Recovery (4 ECTS)**	ISO 31500 • Base concepts of risk assessment and management • Setting a risk analysis • Assessment, controlling and reducing risk • Using of risk management tools • Communication of risk ISO 22301 • Business Continuity (BCM) policies and strategies • Developing, implementing, maintain and reviewing BCM dispositions • Integrating BCM in company culture	**48**	**568**
15	**Asset Management (3ECTS)**	Focus is on Physical Asset Management by integration of the contents of previous modules. Other type of Assets are only considered insofar as they affect the optimal management of physical asset • Intangible Assets: Social Accountability, Environmental, Social and Health impacts, Intellectual Property, Brand, Patents • Financial Asset: financial resources required for infrastructure investments, operation, maintenance and materials. Interface: lifecycle costs, operating costs, value of asset performance • Human asset: the behaviours, knowledge and competence of the workforce have a fundamental influence on the performance of the physical Assets. Interface: motivation, communication, roles and responsibilities, knowledge, leadership, teamwork • Information Asset: good quality data and information are essential to develop, optimize and implement asset management plans. Interface: condition, performance, activities, costs and opportunities	**32**	**600**
16	**Project Work (10ECTS)**	During the stage, the participant will develop an original Project Work.		