

Course unit title:	Design and Organisation of Production Systems		
Course unit code:	ME412		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (2 nd Cycle)		
Year of study:	4		
Semester when the unit is delivered:	7 (Fall)		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr. Michalis Menicou		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> 1. Describe the main modes of manufacturing (project, job, batch, continuous) and reproduce the product-process matrix. 2. Apply Quality Function Deployment (QFD) procedure for product design exercises and apply Group Technology method in engineering design problems 3. Develop alternative capacity plans with alternative technology requirements 4. Apply Project management principles, and project management tools such as Gantt charts, PERT analysis, and Critical Path Method. 5. Choose layout type (fixed-position, process, cell, product, mixed) and decide which layout design technique to employ, such as line-balancing techniques and relationship charts. 6. Calculate Process Reliability by employing exponential and normal distributions 7. Apply Statistical Process Control and compute Process Capability. 8. Employ commercial software to model and develop actual project schedules and calculate vital parameters (CPM, duration, resources, budget etc); also employ commercial software to model and solve optimization problems. 		
Mode of delivery:	Face-to-face		
Prerequisites:	ME 305	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	<ul style="list-style-type: none"> • Design of a Production System: <ul style="list-style-type: none"> - Design of Goods (Product Life cycle, QFD approach, Make-or-by decisions, Group Technology); - Selection of Manufacturing Process (Process types: Project, Job, batch, continuous; The product – process matrix); - Capacity Planning (Forecasting demand fluctuations; measuring capacity; alternative capacity plans); - Location selection (the location decision, evaluation of alternatives); - Production Layout (Types of layout: Fixed – position, Process, Cell, Product, Mixed; selecting a layout type; line balancing; relationship charts); - Labour planning (Job classifications and work rules, Work schedules). - Product reliability (its estimation using exponential and normal distributions), product availability - Process Optimisation (simplex method and use of Microsoft Excel/ Solver to model optimisation problems). - Product reliability (its estimation using exponential and normal distributions), product availability - Process Optimisation (simplex method and use of Microsoft Excel/ Solver 		

	<p>to model optimisation problems).</p> <ul style="list-style-type: none"> • Organisation of a production System: <ul style="list-style-type: none"> - Job Design (motivation theories, job expansion, self – directed teams, ergonomics); - Work measurement (Labour standards; Time studies); - Quality management (TQM, Cause-and Effect diagrams, SPC) • Project management and use of commercial software to form project management schedules (Microsoft Project).
Recommended and/or required reading:	
Textbooks:	<ul style="list-style-type: none"> • Operations Management, by William J. Stevenson, McGraw-Hill/ Irwin, ISBN: 0-07-304191-2, 9th edition, 2007. • Operations Management, by Jay Heizer, Barry Render, Prentice Hall, 9th edition, 2007, ISBN-10: 0138128782, ISBN-13: 9780138128784.
References:	<ul style="list-style-type: none"> • Managing Engineering and Technology by Dan Babcock, Lucy Morse, Prentice Hall, 2002
Planned learning activities and teaching methods:	<p>The taught part of course is delivered to the students by means of lectures, conducted with the help of computer presentations. Lecture notes and presentations are available through the web for students to use in combination with the textbooks.</p> <p>Lectures are supplemented with laboratory work carried out on Microsoft Project. During laboratory sessions, students use commercial software to model and develop actual project schedules and calculate vital parameters (CPM, duration, resources, budget etc).</p>
Assessment methods and criteria:	<ul style="list-style-type: none"> • Laboratory Assignment 12% • Tests 28% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No