

PROGRAMME OF "IMPIANTI CHIMICI II"
"CHEMICAL PLANTS II"

<ul style="list-style-type: none"> • CODE: I2H014 • TYPE OF COURSE UNIT: COMPULSORY FOR THE CHEMICAL ENGINEERING SPECIALIZATION • LEVEL OF COURSE UNIT: SECOND CYCLE • YEAR OF STUDY: SECOND YEAR, FIRST SEMESTER 		
NUMBER OF ECTS CREDITS: 6 (WORKLOAD IS 150 HOURS; 1 CREDIT = 25 HOURS)		
Teacher: Marina Prisciandaro (marina.prisciandaro@univaq.it)		
1	Course objectives	<p>THE MAIN AIM OF THE COURSE IS TO PROVIDE METHODOLOGIES FOR THE ADVANCED SIZING AND OPERATION OF CHEMICAL PLANTS AND THE DESIGN AND ANALYSIS OF THE MAIN COMPLEX CHEMICAL ENGINEERING PROCESS SCHEMES, INCLUDING THEIR CONTROL AND ENVIRONMENTAL IMPACT. OBJECTIVES OF THE COURSE ARE ALSO TO PROVIDE ALL NECESSARY INSTRUMENTS FOR THE SCREENING OF PROCESSING ALTERNATIVES AND THE REDESIGN OF CHEMICAL PROCESSES FOR POLLUTION PREVENTION AND ENERGY SAVING.</p>
2	Course content and Learning outcomes (Dublin descriptors)	<p>THIS COURSE COMPRISES MANY OF THE ADVANCED OPERATIONS IN CHEMICAL PLANTS SUCH AS GAS ABSORPTION WITH CHEMICAL REACTION, MULTICOMPONENT DISTILLATION (SHORT CUT AND RIGOROUS METHODS), NON-IDEAL DISTILLATION (AZEOTROPIC, EXTRACTIVE), LIQUID-LIQUID EXTRACTION. THE DESIGN AND OPERATION OF THESE DEVICES IS EMPHASIZED. COURSE CONTENTS INCLUDE: SIZING OF PROCESS EQUIPMENT FOR COMPLEX PROCESS LAYOUTS; PRELIMINARY DESIGN OF A LARGE INDUSTRIAL PROJECT.</p> <p>STUDENTS SHOULD HAVE:</p> <ul style="list-style-type: none"> - KNOWLEDGE OF FUNDAMENTALS OF MATHEMATICS AND PHYSICS, APPLIED TO SOLVE ENGINEERING PROBLEMS; - KNOWLEDGE OF THERMODYNAMICS AND FUNDAMENTALS OF MOMENTUM, HEAT AND MASS TRANSFER. <p>STUDENTS WILL BE ABLE TO:</p> <ul style="list-style-type: none"> - IDENTIFY, FORMULATE, AND SOLVE ENGINEERING PROBLEMS; - READ AND UNDERSTAND A COMPLEX PROCESS LAYOUT; - SIZE DIFFERENT PROCESS EQUIPMENTS; - DESIGN A COMPLEX PROCESS SCHEME WITH RELATIVE FLOWSHEET AND CONTROL LAYOUT; - CARRY OUT MASS AND ENERGY BALANCES ON PROCESS SCHEME; - EVALUATE ENERGETIC, ECONOMIC AND ENVIRONMENTAL PERFORMANCES OF DIFFERENT PROCESSES.
3	Prerequisites and learning activities	PREREQUISITES: MATHEMATICS; CHEMISTRY; PHYSICS; THERMODYNAMICS.
4	Teaching methods and language	<p>LECTURES AND EXERCISES. LANGUAGE: ITALIAN / ENGLISH</p> <p>REF. TEXT BOOKS</p> <p>KERN, PROCESS HEAT TRANSFER, MCGRAW-HILL</p> <p>ROBERT E. TREYBAL, MASS TRANSFER OPERATIONS, MCGRAW-HILL</p> <p>COULSON & RICHARDSON, CHEMICAL ENGINEERING, PERGAMON PRESS</p> <p>PERRY, GREEN, PERRY'S CHEMICAL ENGINEER'S HANDBOOK, MCGRAW-HILL</p>
5	Assessment methods and criteria	ORAL EXAMINATION; DEVELOPMENT AND DISCUSSION OF A TECHNICAL REPORT REALIZED BY STUDENTS, WHOSE TOPIC IS THE INDUSTRIAL APPLICATION OF A CHEMICAL ENGINEERING UNIT OPERATION.