



Specialist Diploma in LEAN & QUALITY SYSTEMS

Duration: 1 year part-time

- > Curriculum focused on the topical area of Lean, Six Sigma and Business Process Modelling and Continuous Improvement
- > Green Belt material covered to enable students to top off their academic award with an industry standard professional qualification
- > Delivery via blended learning teaching methodologies
- > Medium-term up-skilling for career advancement or specialisation and/or cross-skilling for career change or cross-team roles
- > Approved by Engineers Ireland for Continuous Professional Development purposes

www.aua.ie

▶ ENTRY REQUIREMENTS

- > Applicants must be in receipt of the Diploma in Science & Technology Studies or a related Diploma or higher qualification. Applicants may use experience in addition to academic qualifications to demonstrate that they satisfy the course prerequisites. Previous study in the area of Statistics will be beneficial.

▶ WHAT TYPE OF COURSE IS IT?

- > This one-year, part-time Diploma course aims to promote an in-depth knowledge of the thinking and techniques behind Lean and Quality Systems in the workplace. Participants will gain knowledge of highly effective tools and systems for streamlining products, processes and services. Problem solving skills will be sharpened. A work-based lean project will require participants to apply their knowledge to real-world scenarios.

The programme is delivered by blended learning, participants receive learning materials in both online and in hard copy format for each module. Materials are specifically designed for independent study and will be supplemented by supporting online learning resources where appropriate. The course requires attendance at tutorials in NUI Galway once every four weeks, or approximately ten Saturdays, from September to June. Between campus visits you will interact with tutors and fellow students via an online learning system.



HOW WILL I BENEFIT?

The course is intended for those who wish to focus their skills with a view to moving into specialist and hybrid lean roles e.g. internal lean consultants, waste minimisation specialists, process optimisation advisors. It will allow those with basic engineering qualifications to up-skill and specialise in lean engineering if taken as a 'top-up' course. It will also allow those in declining sectors to convert their skills and transfer their experience to the sector e.g. unemployed manufacturing managers, operatives and technicians. Expertise in Lean and Six Sigma is currently in strong demand across all sectors.

On completion of the course graduates will have highly marketable, up-to-date and confidence-building knowledge and skills relevant to product, process and service optimisation and improvement. They will have practiced and been assessed on a range of technical and transferable skills which will be beneficial at the personal, enterprise and community levels.

If graduates so wish, they can progress to the B.Sc. in Science & Technology Studies (NQF level 8) with credit for their studies. In this case they will be exempt from one elective stream in the Degree cycle.

CURRICULUM

This Specialist Diploma consists of four inter-related taught modules and a project, each worth 6 ECTS, giving a total of 30 ECTS.

The four taught modules are:

- > Problem Solving Tools & Techniques
- > Enterprise Modelling & Simulation
- > Lean Thinking & Lean Tools
- > Quality Science – Six Sigma

The module contents are presented at the end of this document.

The project topic is chosen by the participant in consultation with their supervisor and will be company based where possible.

LEARNING OBJECTIVES

On completion of the course participants should have:

- > Expert problem solving skills
- > An appreciation of lean thinking and lean tools
- > Good technical knowledge of quality science and specialist knowledge of Six Sigma techniques
- > Technical knowledge of enterprise modelling and simulation with a view to optimising business processes
- > An appreciation of lean and quality systems within manufacturing and services sectors
- > Improved their capabilities in the area of change management to facilitate continuous business process improvement

ASSESSMENT

Assessment of the taught modules is through continuous assignments, written examinations and in some cases practical laboratory sessions. Exams take place at the end of each semester. The project is assessed through staged delivery of a project report. The award mark is based on an average result of all five modules. The qualification is considered a minor award (30 ECTS) at Degree level.

In addition to the academic qualification students will have the opportunity to present for Green Belt certification in semester two if they choose, so that they may concurrently achieve a professional qualification.

COURSE STRUCTURE

The course is offered over one academic year (September to June) on a part-time basis. Two taught modules are completed each semester (September to December and January to June) while the project is completed over the academic year.

FEES

The fees for the course are €2,000 for EU students and €2,500 for non-EU students.

This fee includes:

- > Registration
- > Tuition fees
- > Course materials
- > Examinations and assessments

The cost of Green Belt certification is not included, and is generally in the region of €200. Participants register for this exam separately if they so choose.

HOW DO I APPLY?

Applications should be made online at www.nuigalway.ie/apply

CONTACT

Further information is available from:

Niamh McHugh
Centre for Adult Learning and Professional Development,
Nuns' Island,
NUI Galway,
091 495845
niamh.mchugh@nuigalway.ie

www.aua.ie

MODULE CONTENTS

LEAN THINKING & LEAN TOOLS

- UNIT 1 HISTORY AND APPLICATION OF LEAN THINKING
- UNIT 2 VALUE STREAM MAPPING
- UNIT 3 CELLULAR MANUFACTURING
- UNIT 4 WORK STANDARDISATION AND STANDARD WORK
- UNIT 5 JUST-IN-TIME MANUFACTURING AND KANBANS
- UNIT 6 SINGLE MINUTE EXCHANGE OF DIES (SMED)
- UNIT 7 CREATING AND SUSTAINING AN ORDERLY WORK ENVIRONMENT WITH 5S
- UNIT 8 KAIZEN
- UNIT 9 VISUAL MANAGEMENT AND THE VISUAL FACTORY
- UNIT 10 OVERALL EQUIPMENT EFFECTIVENESS (OEE)
- UNIT 11 TOTAL PREVENTATIVE MAINTENANCE (TPM)
- UNIT 12 JIDOKA, POKE YOKE AND QUALITY
- UNIT 13 LEAN SUPPLY CHAINS
- UNIT 14 LEAN PRODUCT DEVELOPMENT AND QUALITY FUNCTION DEPLOYMENT
- UNIT 15 BUILDING A LEAN ORGANISATION
- UNIT 16 LEAN SYSTEMS: CASE SYSTEMS



QUALITY SCIENCE – SIX SIGMA

- UNIT 1 HISTORY AND DEVELOPMENT OF QUALITY SCIENCE
- UNIT 2 REVIEW OF THE SIX SIGMA METHODOLOGY
- UNIT 3 THE STATISTICAL SUMMARY
- UNIT 4 STATISTICAL TESTS
- UNIT 5 ESTABLISHING LINEAR RELATIONSHIPS
- UNIT 6 MULTIPLE REGRESSION
- UNIT 7 MULTIPLE REGRESSION II
- UNIT 8 NON-PARAMETRIC TESTS
- UNIT 9 PROCESS CONTROL CONCEPTS
- UNIT 10 PROCESS CAPABILITY INDICES
- UNIT 11 STATISTICAL PROCESS CONTROL (SPC)
- UNIT 12 STATISTICAL PROCESS CONTROL FOR VARIABLE DATA
- UNIT 13 STATISTICAL PROCESS CONTROL FOR ATTRIBUTE DATA
- UNIT 14 SHORT RUN SPC
- UNIT 15 INTRODUCTION TO DESIGN OF EXPERIMENTS I
- UNIT 16 INTRODUCTION TO DESIGN OF EXPERIMENTS II



PROBLEM SOLVING TOOLS & TECHNIQUES

- UNIT 1 FOUNDATIONS OF SIX SIGMA: PRINCIPLES OF QUALITY MANAGEMENT
- UNIT 2 PRINCIPLES OF SIX SIGMA
- UNIT 3 PROJECTION MANAGEMENT
- UNIT 4 PROJECT SELECTION AND DEFINITION
- UNIT 5 PROCESS MEASUREMENT - PART I
- UNIT 6 PROCESS MEASUREMENT - PART II
- UNIT 7 PROCESS ANALYSIS - PART I
- UNIT 8 PROCESS ANALYSIS - PART II
- UNIT 9 PROCESS IMPROVEMENT - PART I
- UNIT 10 PROCESS IMPROVEMENT - PART II
- UNIT 11 PROCESS CONTROL - PART I
- UNIT 12 PROCESS CONTROL - PART II
- UNIT 13 DESIGN FOR SIX SIGMA: CONCEPT AND DESIGN DEVELOPMENT - PART 1
- UNIT 14 DESIGN FOR SIX SIGMA: CONCEPT AND DESIGN DEVELOPMENT - PART II
- UNIT 15 DESIGN FOR SIX SIGMA: OPTIMISATION AND VERIFICATION
- UNIT 16 DESIGN FOR SIX SIGMA IMPLEMENTATION



ENTERPRISE MODELLING & SIMULATION

- UNIT 1 INTRODUCTION TO ENTERPRISE MODELLING
- UNIT 2 COMMON ENTERPRISE MODELLING TOOLS AND TECHNIQUES
- UNIT 3 PRODUCT MODELLING AND THE PRODUCT DEVELOPMENT PROCESS - INTRODUCING THE ROLE OF CAD AND CAM
- UNIT 4 INTRODUCTION TO SIMULATION
- UNIT 5 BUSINESS PROCESS REENGINEERING - AN OVERVIEW
- UNIT 6 ENTERPRISE MODELLING FOR BUSINESS PROCESS IMPROVEMENT
- UNIT 7 CASE STUDY: BUSINESS MODELLING FOR IMPROVEMENT IN THE MEDICAL INDUSTRY
- UNIT 8 CASE STUDY: BUSINESS MODELLING IN THE PHARMACEUTICAL INDUSTRY
- UNIT 9 CASE STUDY: MODELLING AND SIMULATION IN THE ANIMAL FEED SUPPLY INDUSTRY
- UNIT 10 CASE STUDY: MODELLING AND SIMULATION OF A FOOD SUPPLY CHAIN
- UNIT 11 CASE STUDY: ENTERPRISE MODELLING ACTIVITY FOR PROCESS IMPROVEMENT AT A HOSPITAL
- UNIT 12 CASE STUDY: BUSINESS PROCESS IMPROVEMENT ACTIVITY AT AN ACCOUNTANCY FIRM
- UNIT 13 CASE STUDY: BUSINESS PROCESS MODELLING IN A MANUFACTURING COMPANY

