Quality Design and Control
Management

Instructor Name: Prof Pradip Kumar Ray
Institute: Indian Institute of Technology Kharagpur
Department: Department of Industrial and Systems Engineering

About Instructor: Professor Pradip Kumar Ray is presently a Professor in the Department of Industrial and Systems Engineering, Indian Institute of Technology (IIT), Kharagpur, India. He served as the Head of the Department during September, 2006 to August, 2009. A mechanical engineering graduate (IIEST, Shibpur) with MTech degree and PhD in industrial engineering (IIT Kharagpur), Professor Ray has about more than thirty-six years of diversified experience - eight years in industry and more than twenty-eight years of teaching and research experience at IIT Kharagpur. He has served as a visiting professor at several institutions abroad and is trained in Japan on Production Management/JIT-based Manufacturing. He has published one text book titled â€˜Product and Process Design for Quality Economy and Reliabilityâ€™, thirteen book chapters, six lecture packages, and 162 papers in international and national journals of repute and conferences in the areas of quality design and control/TQM, healthcare systems management, productivity engineering, process optimization, ergonomics/human factors engineering, safety engineering and management and other related topics. His areas of interest and research include productivity modelling, quality engineering, ergonomics, healthcare quality management, engineering asset management and JIT-based/lean engineering and operations management. He has secured substantial number (27 till date) of industry and research grants. He has supervised 17 PhD scholars till date with 6 research scholars currently working under him. He has supervised more than 119 MTech and 74 B-Tech projects till date. He has coordinated several outreach training programmes and courses (more than 45) for industries and academic institutions on several topics, such as MHRD-sponsored four GIAN courses on Engineering Asset Management, Ergonomics and Human Factors Engineering, Production and Operations Management, and Quality Engineering in Products and Processes, and other courses on SPC, TQM, Six Sigma, JIT/Lean Engineering, Materials Management, Environment Management, Workplace Stress Management and Ergonomics including long-duration training programme on Industrial Safety Engineering and Safety Competence Building (SCB) in Material Handling for Tata Steel. Currently, he acted as an investigator in two-year duration UKIERI-sponsored project on â€˜Climate Change Issues and Environmental Performance of SMEs in India and the UKâ€™ in collaboration with Aston Business School, Aston University, Birmingham, UK. Currently, he has acted as Chief Expert guiding APO-sponsored project on â€˜Research on Institutions Offering Productivity Coursesâ€™ for six Asian countries, and as the Principal

Pre Requisites: : No Pre-requisites
Core/Elective: : Core
UG/PG: : UG
Industry Support : Tata Steel, Tata Motors, L&T, Linde and similar such manufacturing and service organizations including IT companies

Course Intro: : The objective of the course is to introduce basic concepts and statistical methods employed for assurance of quality in products, processes and systems in an industrial environment (manufacturing and service organizations), such as Management and Control of Quality and Quality System, Statistical Process Control, Process Capability Analysis, Acceptance Sampling, Process Capability Analysis, Design for Reliability, Robust Design and Taguchi Method for Quality Improvement. Such a comprehensive course is required to be offered by Mechanical Engineering, Industrial Engineering, Manufacturing/Production Engineering and related departments at undergraduate level and by Management/Business schools at the postgraduate level in any renowned university or educational institute in India and abroad. It is essential that the students studying in these disciplines at UG and PG levels should enroll themselves in this course.

SL.NO	Week	Module Name
1	1	History and Evolution of Quality Control and Management
2	2	Management of Quality-I
3	3	Management of Quality-II
4	4	Statistical Process Control-I
5	5	Statistical Process Control-II
6	6	Process Capability Analysis
7	7	Acceptance Sampling-I
8	8	Acceptance Sampling-II
9	9	Design for Reliability-I
10	10	Design for Reliability-II
11	11	Quality by Experimental Design
12	12	Robust Design and Taguchi Method