



QUALITY DESIGN AND CONTROL

PROF. PRADIP KUMAR RAY

Department of Management Studies
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INTENDED AUDIENCE : Management, Industrial Engineering, Mechanical Engineering, Production Engineering and related disciplines.

INDUSTRIES APPLICABLE TO : Tata Steel, Tata Motors, L&T, Linde and similar such manufacturing and service organizations including IT companies

COURSE OUTLINE :

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.

ABOUT INSTRUCTOR :

Prof. 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 (IEST, 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 'Product and Process Design for Quality Economy and Reliability', 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 'Climate Change Issues and Environmental Performance of SMEs in India and the UK' in collaboration with Aston Business School, Aston University, Birmingham, UK. Currently, he has acted as Chief Expert guiding APO-sponsored project on 'Research on Institutions Offering Productivity Courses' for six Asian countries, and as the Principal Investigator in MHRD and OFB-sponsored IMPRINT project on manufacture of shells for field guns with improved design and performance. He organized the International Conference, MESH-2016 in December, 2016 at IIT Kharagpur as its convener. He has attended several international conferences/congresses as a keynote speaker and a session chair.

Professor Ray is a certified Lead Assessor for ISO-9001 registration, and is a member of several professional bodies, such as INFORMS and IIMM, and a Fellow of World Academy of Productivity Sciences and a Fellow of Institution of Engineers (India).

COURSE PLAN :

Week 1: History and Evolution of Quality Control and Management

Week 2: Management of Quality-I

Week 3: Management of Quality-II

Week 4: Statistical Process Control-I

Week 5: Statistical Process Control-II

Week 6: Process Capability Analysis

Week 7: Acceptance Sampling-I

Week 8: Acceptance Sampling-II

Week 9: Design for Reliability-I

Week 10: Design for Reliability-II

Week 11: Quality by Experimental Design

Week 12: Robust Design and Taguchi Method