MBCG 746	Total Quality Management	L	T	P	C
Version 1.0		3	0	0	3
Pre-requisites/Exposure					
Co-requisites	--				

Course Objectives

1. To help students to appreciate the need for Quality Concepts in the modern business environment
2. To establish the connect Business Performance and adherence to Quality Philosophy
3. To appreciate the process of implementing Quality Programs in the organization

Course Outcomes: On completion of this course, the students will be able to

CO1. Analyze Business Processes and identify quality shortcomings
CO2. Design Quality Improvement Programs
CO3. Implement Quality Programs and Monitor them

Catalog Description

Total Quality Management is taught as an elective to students of Operations Management and also, Logistics & Supply Chain Management in the third semester i.e. when they have acquired an overview of an organization the Internship and are at the beginning of the placement cycle. It helps students to pursue certification in six-sigma (Green Belt). This course emphasizes the philosophy of quality management, the structure of analysis (DMAIC and DMADV) and statistical tools used in it.

Course Content

Unit I: Introduction 6 lecture hours
Quality, Reliability, Quality Assurance, Monitoring and Control, Big and Small Q, Total Quality Management, Cost of Quality, Leadership, Customer Satisfaction, Employee Involvement, Contribution of Quality Guru's to Quality Management

Unit II: TQM Principles 6 lecture hours
Business Processes, Process Analysis and Management, Continuous Process Improvement and Performance Measures, Supplier Relationship and Quality in Supply Chain Partners
Quality in Service Sector, SERVIQUAL

Unit III: Statistical Process Control 12 lecture hours
SEVEN TOOLS OF QUALITY: Old Planning Tools - Pareto chart, Cause-and-effect Diagram, Check Sheet, Histogram, Scatter Diagram, Control Charts and Graphs.
SEVEN TOOLS OF QUALITY: Addition New Planning Tools – Jiro Kawakita Diagram, Relationship Diagram, Tree Diagram (FAST), Matrix, Arrow Diagram, Process Decision Program Chart
STATISTICAL FUNDAMENTALS (HANDS-ON WITH MINITAB):
Statistical Thinking at various levels of Organization; Probability Distribution; Sampling, Sampling Distribution; Statistical Estimation (Confidence Limits), Sample Size, Hypothesis Formulation and Testing;
STATISTICAL FUNDAMENTALS (HANDS-ON WITH MINITAB):
Classical and Modern Methods of Experimentation, Design of Experiment, Taguchi's approach to Experimental Design, Shianin and Red X Approach to Experiment Design; Regression analysis

Unit IV: TQM Tools 4.5 lecture hours

Benchmarking, Quality Function Deployment (QFD), Taguchi Quality Engineering, Total Productive Maintenance (TPM)

Unit V: Quality Systems **3 lecture hours**
ISO 9000, ISO 14000

Unit VI: Overview of Six Sigma **4.5 lecture hours**
Introduction to Six Sigma, Application of Six Sigma, Methodology and Tools for Lean Six Sigma

Text Books

Gryna Frank M., Chua Richard C.H., Defeo Joseph A. (2001). Juran's Quality Planning & Analysis for Enterprise Quality, 5th Edition. Tata McGraw-Hill

Reference Books

1. Charantimath, Poornima M. (2012). Total Quality Management, 2nd Edition. Pearson

Modes of Evaluation:
Components of Continuous Evaluatiom: Individual Assignment (IA)/Group Assignment (GA)/Written Quiz (WQ)

Components	IA	GA	WQ	End Semester Examination
Weightage (%)	30	10	10	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	COURSE OUTCOMES (COs)	**POs**
CO 1	Analyze Business Processes and identify quality shortcomings	PO 1,2, 3,4,7,8,9,10, 11,13, 14
CO 2	Design Quality Improvement Programs	PO 1,2, 3, 7,8,9,10, 11,14
CO 3	Implement Quality Programs and Monitor them	PO 1,2, 3, 8,9,10, 11, 13,14

Program Outcome / Course Outcome mapping

Course Outcomes	CO 1	CO 2	CO 3

PO 1	3	3	3
PO 2	3	3	3
PO 3	3	3	3
PO 4	3	1	1
PO 5	2	2	1
PO 6	1	1	1
PO 7	3	3	1
PO 8	3	3	3
PSO 9	3	3	3
PSO 10	3	3	3
PSO 11	3	3	3
PSO 12	1	1	1
PSO 13	3	1	3
PSO 14	3	3	3

		Students will be able to develop and evaluate alternate managerial decisions and identify optimal solutions	Students will demonstrate effective application capabilities of their conceptual understanding to the real world business situations	Students will be able to exhibit effective decision making skills, employing analytical and critical thinking ability	Students will demonstrate effective oral and written communication skills in the professional context	Students will able to work effectively in teams and demonstrate team building capabilities	Students will exhibit leadership and networking skills while handling business situations	Students will demonstrate sensitivity towards ethical and moral issues and have ability to address them in the course of business	Students will demonstrate employability traits in line with the changing dynamics of the industry	Students will demonstrate strong conceptual knowledge in the functional area of management as well as LSCM domain	Students will demonstrate effective understanding of relevant functional areas of management and their application in LSCM	Students will demonstrate analytical skills in identification and resolution of business problems pertaining to LSCM & general management	Students will exhibit the ability to integrate functional areas of management with domain perspective for the purpose of planning, implementation & control of LSCM	Students will have global perspective towards business situations in the area of LSCM	Students will exhibit deployable skills pertinent to the LSCM sector
Course Code	Course Title	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PSO 9	PSO 10	PSO 11	PS12	PSO 13	PSO14
MBC G 746	Total Quality Management	3	3	3	2	2	1	3	3	2	2	3	2	3	3

1 – Weakly mapped
2 – Moderately mapped
3 – Strongly mapped

Model Question Paper

Name:

Enrolment No:

UPES

Course: MBCG 746 – Total Quality Management

Programme: MBA- Logistics & Supply Chain Management **Semester: 3**

Time: 03 hrs. **Max. Marks:100**

Instructions:

Attempt all questions from **Section A** (each carrying 1 marks); any **Two Questions** from **Section B** (each carrying 20 marks)**. Section C** is Compulsory (carrying 40 marks)**.**

Section A (attempt all questions)

1.	a.Quality solution approach to a …….. problem is to restore the status quo and that for a chronic problem is to …….. the status quo; the former is accomplished by a proper system of …….. and, the latter is accomplished by taking a series of …….. to accomplish the objective (04/04)	**[4]**
	b.To manage the sporadic and chronic quality problems leading to waste can effectively be dealt on a continuous basis by systematic Quality Planning for Quality …….. and Quality ……..– these three are otherwise known as …….. or, Quality …….. (04/08)	**[4]**
	c.The approaches and, the tools used in Total Quality Management can also be used for other parameters than waste, e.g. ……., …….. and, …….. etc. (03/11)	**[3]**
	d.A proper …….. of the process drawn at the appropriate …….. should help to take two types of journeys viz., …….. journey i.e. from symptoms to …….. and, …….. journey i.e. from cause to …….. (06/17)	**[6]**
	e.Quality Gurus have often condensed the essence of Total Quality in a short and precise phrase. These wisdom statements are supplementary, they do not contradictory, they emphasis a particular aspect, as a result we have many profound insights into Total Quality. Some of them are – "Confirmation to Specification" it was proposed by …….. "Predictable Degree of Uniformity" was proposed by …….. and, "Loss to Society" proposed by …….. (03/20) *Please choose the word from below* Crosby / control / change / quality improvement projects remedy / remedial / quality control / Improvement diagnostic / trilogy / Taguchi / cycle time safety / Deming / cause / flow chart Juran / level / sporadic / Productivity	**[3]**

	SECTION B (Attempt any **Four Questions)**	
	What is Pareto Priority Index, discuss? (Marks 05)	**[5]**
	What is Big Q and Small q in the context of Quality Management? (Marks 05)	**[5]**
	What are the tools for quality implementation in revenue and cost side of business (Marks 05)	**[5]**
	Do you agree that improvement in quality will decrease productivity; discuss (Marks 05)	**[5]**
	What are the sources of cost of poor quality? (Marks 05)	**[5]**
	SECTION C is Compulsory	

2.	Cost of Poor Quality study conducted at an Orthopedic Implants Company in Jaipur found that, in the previous year the internal failure costs alone is more than Rs. 11.5 crores; break up is given below. Do Pareto Analysis and identify candidate quality improvement projects (Marks 10). **Cost Heads** / **Amount in Rs.** / **Cost Heads . . . . . contd.** / **Amount in Rs.** Design Changes 333,000 — Obsolete Inventory Reserves 11,552,776 Dispositions Scrap 2,473,000 — Obsolete Inventory Reserves Carrying Cost 1,617,389 Downtime 212,834 — Production Rework 2,470,000 Excess Inventory Reserves 36,253,810 — Production Scrap 6,469,000 Excess Inventory Reserves Carrying Cost 5,075,533 — QC re-inspection indirect costs 642,114 Intermediate Stock Carrying Cost 2,269,540 — Safety Stock 16,213,000 Intermediate Stock Inventory 25,785,999 — Safety Stock Carrying Cost 3,610,040 Investigation of Failure 445,536 — Vendor Rework Charges 115,000 **TOTAL** **115,538,571**	**[10]**	
3.	Construct a Pareto Priority Index and rank the candidate projects based on the data given in Table 02 (Marks 05). Will you propose Management to go for the top ranking project or, use some qualitative criteria to consider along with the rankings; what are those criteria, discuss (Marks 05). **Project** / **Savings (Rs. in '000)** / **Probability of Success** / **Cost (Rs. in '000)** / **Project Completion Time (in Years)** A 100 0.7 10.0 2.00 B 50 0.7 2.0 1.00 C 30 0.8 1.6 0.25 D 10 0.9 0.5 0.50 E 1.5 0.6 1.0 0.10	**[10]**	
4.	Give simple, short, one-line definition of Quality Cost (Marks 01M). What are the sources of Quality Cost, discuss (Marks 03M x 3). What is your observation on the annual quality cost data given below for a tire company? Give at least five distinct observations (Marks 02 x 5). **ANNUAL QUALITY COST : Mercury Tires Ltd., Dehradun** *all figures in Rs.* **Cost of Quality Failures** — **Cost of Appraisal** Defective Stock 3,276 — Incoming Inspection 32,655 Repairs and Rework 73,229 — Process Inspection 32,582 Scarp Collection 2,288 — Output Inspection 25,200 Scrap Generated 187,428 — Spot Inspection 65,910 Consumer Adjustments 408,200 — **TOTAL** 147,347 Downgrading and Seconds 22,838 — **Cost of Prevention** Customer Dissatisfaction NA — Local Plant QC Engineering Dept. 7,848 Migration of Loyal Customers NA — Corporate QC Engineering Dept. 30,000 **TOTAL** **697,259** — **TOTAL** **37,848** **GRAND TOTAL** **882,454**	**[10]**	
	SECTION D is Compulsory		
5.	Based on the following information prepare a quality summary on annual basis. The Federated Screw Company manufactures a wide variety of made-to-order screws for industrial companies. The design is usually supplied by the customers. Total manufacturing payroll is 260 people with sales of about $28 million. Operations are relatively simple but geared to high-volume production. You have been asked to prepare a quality cost summary for the company and have made the following notes.	**[30]**	

The quality control department is primarily a final inspection department (eight inspectors), which also inspects the incoming wire. Patrol inspection (One inspector) is performed in the Heading Room by checking the first and last piece of each run. The quality control department also checks and sets all gears used by that department and by production personnel. An inspector's salary is approximately $24,000 a year.

Quality during manufacturing is the responsibility of the operator setup teams assigned to batteries of about four machines each. It is difficult to estimate how much of their time is spent checking setups or checking the running of the machines, so you have not tries to do this yet. Production has two sorting INSPECTORS, EACH EARNING $18,000, WHO SORT lots rejected by the final inspection.

The engineering department prepares quotations, designs tools, plans the routing of jobs, and establishes quality requirements, working from customer prints. The engineers also do trouble shooting, at a cost of about $20,000 a year. Another $16,000 is spent in previewing customers' prints to identify critical dimensions, trying to get such items changed by the customer, and interpreting customers' quality requirements into specifications for use by the Federated inspectors and manufacturing personnel.

Records of scrap, rework, and customer returns are meager, but you have been able to piece together a certain amount of information from records and estimates:

Scrap from final inspection rejections and customer returns amounted to 438,000 and 667,000 pieces, respectively, for the last two months.

Customer returns requiring rework average about 1 million pieces per month.

Scrap generated during production is believed to be about half of the total floor scrap (the rest is not quality related) of 30,000 kgs. per month . . . 30,000 POUNDS PER MONTH.

Final inspection rejects an average of 400,000 reworkable pieces per month. These items can then be flat rolled or rerolled.

Rough cost figures have been obtained from the accountants, who say that scrap items can be figured at $1.20 per thousand pieces, FLOOR SCRAP AT $800 PER THOUSAND POUNDS, REWORKING OF CUSTOMER RETURNS AT $4.00 PER THOUSAND PIECES, AND FLAT ROLLING OR REROLLING AT $1.20 PER THOUSAND PIECES. These figures are supposed to include factory overhead.