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| **PROGRAM** | **Master of Business Administration** |
| **SEMESTER** | **IV** |
| **COURSE TITLE** | **Six Sigma** |
| **COURSE CODE** | **04MB0449** |
| **COURSE CREDITS** | **2** |
| **COURSE DURATION** | **28 hours** |

**COURSE OUTCOMES:**

* Describe the concepts of Six Sigma
* Explain the concepts of process
* Apply the five-step DMAIC model as a framework to organize process improvement activity.
* Analyze the wide range of process improvement techniques, including design of experiments, within the DMAIC model.
* Determine the organizational factors that are necessary groundwork for a successful Six Sigma effort.
* Design your Six Sigma skills to lead a successful process improvement project and deliver meaningful results to the organization

**COURSE CONTENTS:**

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| **Unit No** | **Unit / Sub Unit** | **Sessions** |
| **I** | **Introduction to Six Sigma**: Six Sigma and Lean Enterprise, Defects Per Million Opportunities Metric (DPMO), Success Stories, Six Sigma History, DMAIC Process, Thought Process Mapping, Process Thinking, Process Mapping, Flow Charts, Value-Added Flow Charts, Deployment Flow Charts, Spaghetti Diagrams, Value Stream Mapping, Balanced Scorecard, Pareto Chart, Project Selection, Project Charter, Project Tracking – Gantt Chart, Stakeholder Analysis, Voice of the customer, Customer Satisfaction & Kano Model, Sample Surveys, Survey Construction, Margin of Error, Affinity Diagrams, CTQC, Tree Diagrams, Critical to Quality, Characteristics (CTQCs), Setting Specifications, Quality Function Deployment, Operational Definition, Variable and Attribute Data, Sampling Plan, Measurement System Analysis, Data Collection – Check Sheet, Benchmarking, Baseline DPMO & Sigma Conversion, Rolled Throughput Yield | 10 |
| **II** | **Measure & Analyse:** Trend Chart, Histograms, Measuring Process Variability, Statistical Process Control, Rational Subgrouping and Moving Range Control Charts, Attribute Control Charts, X-bar and R Control Charts • Process Capability, Analyze I – Potential Root Cause, Cause and Effect Diagrams (Fishbone Charts), Five-Why, One-How, FMEA, Scatter Plots, Regression and Correlation Analysis, Multiple Regression, Logistic Regression, Introduction to Hypothesis Testing, Confidence Intervals and Hypothesis Testing, Comparison of Two Treatments: Z-test, F-Test, t-test, Comparison of Multiple Treatments – ANOVA, Chi-Square for Multiple Proportions, Comparison of Variances – Chi-Square Test, Non-parametric Testing, Hy-Court TV TM Learning Lab, Analyze III – Design of Experiments • Introduction to Design of Experiments • Single Factor Experiments • Full Factorial Experiments, Fractional Factorial Experiments, General Factorial Experiments, Experiment Simulations Advanced Topics. | 9 |
| **III** | **Improve:** Design for Manufacturability/ Serviceability/Reparability (DFSS), Brainstorming Continuous Flow (Little’s Law), Quick Changeovers, Implementing Work Cells, Theory of Constraints, Pull Scheduling, Narrowing the List of Ideas, FMEA, Error-proofing, Corrective Action Matrix, Piloting a Solution, System Dynamics, Control Plan, SPC Revisited, FMEA Revisited, Visual Control – 5-S, CHECK Process, Total Productive Maintenance | 9 |

**EVALUATION:**

**The students will be evaluated on a continuous basis and broadly follow the scheme given below:**

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|  | **Component** | **Weightage** |
| A | Continuous Evaluation Component (Assignments / Presentations/ Quizzes / Class Participation/ etc.) | 0% (C.E.C.) |
| B | Internal Assessment | 50% (I.A.) |
| C | End-Semester Examination | 50% (External Assessment) |

**SUGGESTED READINGS:**

**Text Books:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No** | **Author/s** | **Name of the Book** | **Publisher** | **Edition and Year** |
| **T-01** | MacCarty, Daniels, Bremer and Gupta | The Six Sigma Black Belt Handbook | Tata McGraw Hill | 2nd Edition,2012 |
| **T-02** | De Feo and Barnard | Juran Institute’s Six Sigma Breakthrough and Beyond | Tata McGraw Hill | 6th Edition,2014 |
| **T-03** | Blashka | Six Sigma Management | Tata McGraw Hill | 10th Editon,2016 |

**Reference Books:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No** | **Author/s** | **Name of the Book** | **Publisher** | **Edition and Year** |
| R-01 | Hubert Ramprasad | TPS-Lean Six Sigma | Sara Books Pvt.Ltd | 9th Edition,2011 |
| R-02 | Donald Benbow | The Certified Six Sigma Black Belt Hand Book | Pearson Publication | 16th Edition,2016 |
| R-03 | Pravin Rajpal | Achieving Business Excellence by Pravin Rajpal | Om Books International, India | 11th Edition,2014 |