



SHARDA
UNIVERSITY
Beyond Boundaries



**SHARDA SCHOOL OF
ENGINEERING &
TECHNOLOGY**

Department of Mechanical Engineering



6σ



COURSE

**Introduction to
Six Sigma
for Engineers
(VAC-502)**

**VALUE ADDED
COURSE BROCHURE-30 HRS
2023-24**

ABOUT THE UNIVERSITY

Sharda University envisions to serve the society by being a global University of higher learning in pursuit of academic excellence, innovation and nurturing entrepreneurship. It has 13,000+ students from 95+ countries, 29 states, and Union Territories, providing cultural diversity and global exposure to students. It has 26000+ alumni who are today leaders in their realms. Sharda University is **NAAC A+** University with Overall **NIRF Rank of 87**. Teaching Learning Center at Sharda University is to equip the faculty members with the expertise, skills and knowledge they need for capacity building of students. Teaching as a profession requires highly specialized skills and knowledge to impact significantly on student learning and therefore teachers must refine their conceptual and pedagogical skills.

ABOUT SCHOOL

Sharda School of Engineering and technology is an open platform for diverse voices where teaching runs parallel to the real world and students are groomed to join the global workforce. SSET is distinguished as one of the top-ranked engineering schools in India. The students at SSET benefit through the professional grooming of renowned faculty and industry experts having experience of tackling pressing engineering problems. Students discover their passion in one of the various offered Engineering majors at the School of Engineering and technology.

ABOUT DEPARTMENT

The department of mechanical engineering is one of the broadest and oldest in the Sharda School of Engineering and Technology, which is constantly evolving with advancements in technology, especially in Automotive Electrical Vehicles, Mechatronics, and Digital Manufacturing. The department offers B. Tech Mechanical Engineering and M. Tech Mechanical Engineering. In addition to theoretical coursework, mechanical engineering students also have access to well-equipped laboratories such as the Mechanical Simulation Laboratory, Computer-Aided Design and Drafting, Mechanical Workshop, Manufacturing Technology Laboratory, Mechanics of Machines and Solids Laboratory, Fluid Mechanics and Turbo Machinery Laboratory, Heat Transfer and RAC Laboratory, IC Engines, Automobile Engineering, and Mechatronics Engineering Laboratory, where they can gain hands-on experience in testing and evaluating mechanical systems. These laboratories include facilities for design simulation, materials testing, thermal testing, fluid mechanics, advance machining processes, automobile engineering and control systems.

VALUE ADDED COURSE (VAC)

The Value added Education Courses aim to provide additional learner centric graded skill oriented training, with the primary objective of improving the employability skills of students.

PURPOSE OF VALUE ADDED COURSE

VACs are pertinent instructional strategies designed to close knowledge gaps in students and provide them a competitive edge in the Job market. The courses' well-defined offspring VACs make them incredibly helpful for enhancing Students' employability quotient by developing a variety of competencies. It aids pupils in laying the creative groundwork for a passion project. (Computers project, quantitative analytics, etc) aside from their occupation courses offering characteristics that can assist in transforming their enthusiasm into occupation. Students can understand basic concepts and terminology of cloud technologies in the current IT environment. Students can classify and analyze the terms of virtualization and its types along with services, types, and challenges with cloud applications.

COURSE DESCRIPTION

This course serves as an introduction to the principles and methodologies of Six Sigma with a specific focus on its application in engineering contexts. Six Sigma is a data-driven approach to process improvement that seeks to enhance efficiency, minimize defects, and optimize overall quality. Designed for engineering professionals, this course equips participants with the essential tools and concepts needed to integrate Six Sigma methodologies into their work.

RESOURCE PERSON

Dr. Sujoy Kumar Dey

PhD. from NERIST, Arunachal Pradesh. M.E. (Mechanical Engineering) from Bengal Engineering and Science University, Shibpur in. B.E. (Mechanical Engineering) from West Bengal University of Technology, Haldia Institute of Technology, Haldia. Diploma in Mechanical Engineering from Central Calcutta Polytechnic.

Experience: 12+ years

COURSE SCHEDULE

Unit	Content	Duration
1	Definition of six sigma, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs	2 h
2	Historical Review	2 h
3	Role of Senior Management, Quality Council, Quality Statements, Strategic Planning,	2 h
4	Standard deviation, Normal distribution	2 h
5	Just in time, 5S, The seven Muda	2 h
6	Pareto chart, voice of customer, basic matrices	2 h
7	ABB, Allied Signal and General electric's case studies	2 h
8	Other quality improvement process	2 h
9	Applying six sigma knowledge	2 h
10	The development of SPC,	2 h
11	Continuous Process Improvement –PDSA Cycle, 5S, Kaizen (Toyota & lean)	2 h
12	Motorola's focus on defects, Challenges in Six Sigma	2 h
13	Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits,	2 h
14	Taguchi Quality curve and Taguchi Quality Loss Function	2 h
15	Industrial application and implementation of six sigma	2 h
Total		30 h

School: SSET
Program: B. Tech
Branch: ALL

Batch: 2023-24
Current Academic Year: 2023-24
Semester: VI

1. Course Code	VAT 502	
2. Course Title	Introduction to Six Sigma for Engineers	
3. Credits	0	
4. Contact Hours (L-T-P)	30 Hours	
Course Type	Value added course	
5. Course Objective	<ul style="list-style-type: none"> • The objective of an "Introduction to Six Sigma for Engineers" course is typically to equip engineering professionals with the fundamental principles and tools of Six Sigma methodology. • Six Sigma is a set of techniques and tools for process improvement, with a focus on minimizing variability and improving overall quality. • The course aims to provide engineers with the knowledge and skills needed to apply Six Sigma concepts to their work, resulting in enhanced efficiency, reduced defects, and improved customer satisfaction. 	
6. Course Outcomes	<p>The student will be able to</p> <p>CO1: Identify and know the aspects of quality in an organization. CO2: Explain the fundamentals and applications of statistics in an organization CO3: Describe the concepts of six sigma CO4: Interpret how processes can be statistically controlled CO5: Classify and describe various six sigma tools. CO6: Define the process of implementing six sigma.</p>	
7. Course Description	<p>This course serves as an introduction to the principles and methodologies of Six Sigma with a specific focus on its application in engineering contexts. Six Sigma is a data-driven approach to process improvement that seeks to enhance efficiency, minimize defects, and optimize overall quality. Designed for engineering professionals, this course equips participants with the essential tools and concepts needed to integrate Six Sigma methodologies into their work.</p>	
8. Outline syllabus		CO Mapping
Unit 1	INTRODUCTION	
A	Definition of six sigma, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs	CO1
B	Historical Review	CO1
C	Role of Senior Management, Quality Council, Quality Statements, Strategic Planning	CO1
Unit 2	BASIC SIX SIGMA AND LEAN CONCEPTS	
A	Standard deviation, Normal distribution	CO2
B	Just in time, 5S, The seven Muda	CO2
C	Pareto chart, voice of customer, basic matrices	CO2
Unit 3	CASE STUDIES AND APPLICATIONS	
A	ABB, Allied Signal and General electric's case studies	CO3
B	Other quality improvement process	CO3
C	Applying six sigma knowledge	CO3
Unit 4	SIX SIGMA PRACTICES	
A	The development of SPC,	CO4
B	Continuous Process Improvement –PDSA Cycle, 5S, Kaizen (Toyota & lean)	CO4
C	Motorola's focus on defects, Challenges in Six Sigma	CO4
Unit 5	SIX SIGMA TOOLS AND IMPLEMENTATION	
A	Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits,	CO5
B	Taguchi Quality curve and Taguchi Quality Loss Function	CO5
C	Industrial application and implementation of six sigma	CO6
Mode of examination	Assignment/Quizzes/Viva	