



SHARDA
UNIVERSITY
Beyond Boundaries



**SHARDA SCHOOL OF
ENGINEERING &
SCIENCES**



COURSE
Introduction to Six Sigma
for Engineers
(NV65002)

VALUE ADDED
COURSE BROCHURE-30 HRS

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 14,000+ 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 Sciences is an open platform for diverse voices where teaching runs parallel to the real world and students are groomed to join the global workforce. SSES is distinguished as one of the top-ranked engineering schools in India. The students at SSES 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 Sciences.

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

Value-Added Courses (VACs) are crucial instructional strategies designed to bridge knowledge gaps in students and provide them with a competitive edge in the job market. These courses enhance students' employability by developing a variety of competencies. VACs help students lay the creative groundwork for passion projects, such as design projects and Manufacturing, beyond their regular coursework. In the context of mechanical engineering, VACs can help students understand basic concepts and terminology related to advanced manufacturing technologies, robotics, and automation. Students can classify and analyze terms related to these technologies, understand their types, applications, and challenges, and apply this knowledge to practical projects. By doing so, VACs transform students' enthusiasm into practical skills, making them more attractive to employers and better prepared for their future careers.

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. Nitesh Kumar

Nitesh Kumar holds Master of Engineering degree in Mechanical Engineering from BITS Pilani and Ph.D from IIT, Dhanbad. He has seventeen years of teaching, research, and administrative experience. He has published papers in international journals of repute. He has guided students for their M.Tech thesis and also guided many undergraduate students for their project. His areas of interest includes Additive manufacturing, Machine Design, Composite materials, and Robotics. He has attended more than twenty FDPs, Workshops, Seminars, and Conferences.

COURSE SCHEDULE

Unit	Content	Duration
1	Definition of Six Sigma and Dimensions of Quality	2 h
2	Quality Planning and Quality Cost Analysis Techniques	2 h
3	Historical Review of Six Sigma	2 h
4	Role of Senior Management, Quality Council, Strategic Planning	2 h
5	Standard Deviation and Normal Distribution	2 h
6	Just-in-Time (JIT), 5S, and Seven Muda (Waste)	2 h
7	Pareto Chart, Voice of Customer (VOC), and Basic Metrics	2 h
8	Case Studies: ABB, Allied Signal, and General Electric	2 h
9	Other Quality Improvement Processes	2 h
10	Applying Six Sigma Knowledge in Engineering	2 h
11	Development of Statistical Process Control (SPC)	2 h
12	Continuous Process Improvement: PDSA Cycle, Kaizen, and Lean	2 h
13	Motorola's Focus on Defects and Challenges in Six Sigma	2 h
14	Quality Function Deployment (QFD) and House of Quality	2 h
15	Taguchi Quality Loss Function and Six Sigma Implementation	2 h
Total		30 h

School:SSET Programme: B. Tech Branch: All		Batch : 2025-29 Current Academic Year : 2026 -27 Semester: III	
1. Course Code	NV65002		
2. Course Title	Introduction to Six Sigma for Engineers		
3. Credits	Audit Course		
4. Contact Hours (L-T-P)	30 Hours		
CourseType	Value added course		
5. Course Objective	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		
6. Course Outcomes	The student will be able to 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.		
7. 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.		
8. Outline syllabus			CO Mapping
Unit 1	INTRODUCTION		
A	Definition of six sigma, Dimensions of Quality, Quality Planning, 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	Assignments / Quizes		
Marks Distribution	Continuous Assessment (CA): 25 End Term Examination (ETE):75		