



Department of Mechanical Engineering	LP: OE18004 Rev. No: 01
B.E/B.Tech/M.E/M.Tech : <u>B.E & B.Tech</u> Regulation: R2018 PG Specialisation : NA Sub. Code / Sub. Name : OE 18004 / Quality Concepts and tools Unit : 1	Date: 20.12.23

Unit Syllabus: Introduction to quality – Perception of Quality – Quality Concept, Different Definitions and Dimensions, Quality Control, Quality Assurance and Quality Management, Quality as Wining Strategy - Statistical Process Control (SPC) - Strategic Management - Quality Management, Ethics and Corporate Social Responsibility

Objective: To introduce basic quality concepts and tools to the students by making them study the importance of various tools and techniques through industry examples and case studies.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Introduction to quality – Perception of Quality	R1,Ch 3 pg 2-3	BB/ICT
2	Different Definitions and Dimensions, Quality Control,	R1,Ch 3 pg 5-10	BB/ICT
3	Quality Assurance and Quality Management,	R1,Ch 3 pg 15-24	BB/ICT
4	2 minute presentation by students about companies who successfully implemented quality management principles - Participative learning	NA	BB/ICT
5	Quality as Wining Strategy	R1,Ch 3 pg 33-42	BB/ICT
6	Statistical Process Control (SPC)	R1,Ch 3 pg 45-58	BB/ICT
7	Strategic Management -Quality Management,	R1, Ch 3 pg 62-66	BB/ICT
8	Ethics and Corporate Social Responsibility	R1, Ch 3 pg 92-95	BB/ICT
9	Participative learning – Different case study discussion	NA	BB/ICT

Content beyond syllabus covered (if any): Quality metrics for product-TV and services-Hospitals

* Session duration: 50 minutes

* ICT – Laptop, Projector, Pen drive, Google Classroom, Microsoft tools, YouTube Videos



Sub. Code / Sub. Name: OE 18004 / Quality Concepts and tools

Unit : II

Unit Syllabus: Flow Charts – Histogram – Check sheet – Cause and Effect diagram – Run charts & Control charts – Pareto charts – Scatter diagram – Spot charts – Pie charts

Objective: To learn quality planning tools and its application in industries

Session No *	Topics to be covered	Ref	Teaching Aids
10	Flow Charts	R1, Ch 5 pg 112-113	BB/ICT
11	Histogram	R1, Ch 5 pg 128-132	BB/ICT
12	Check sheet	R1, Ch 5 pg 134-141	BB/ICT
13	Cause and Effect diagram	R1, Ch 5 pg 142-145	BB/ICT
14	Run charts & Control charts	R1, Ch 5 pg 162-167	BB/ICT
15	Pareto charts	R1, Ch 5 pg 172-183	BB/ICT
16	Scatter diagram	R1, Ch 5 pg 184-187	BB/ICT
17	Spot charts	R1, Ch 5 pg 192-198	BB/ICT
18	Pie charts Demonstration with YouTube videos- Participative learning	R1, Ch 5 pg 211-213	BB/ICT
Content beyond syllabus covered (if any): COVID case analysis using QC tools			

* Session duration: 50 mins

* ICT – Laptop, Projector, Pen drive, Google Classroom, Microsoft tools, YouTube Videos



Sub. Code / Sub. Name: OE 18004 / Quality Concepts and tools

Unit : III

Unit Syllabus : Affinity diagram – Interrelationship diagram – Tree diagram –Matrix diagram- Prioritization matrix – Process decision program chart – Activity network diagram

Objective: To learn quality planning tools and its application in industries.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Introduction to new tools and its need in industries	R1, Ch 7 pg 52 - 66	BB/ICT
20	Affinity diagram	R1, Ch 7 pg 173-186	BB/ICT
21	Interrelationship diagram –	R3, Ch 7 pg 10-20	BB/ICT
22	Tree diagram	R1, Ch 7 pg 201-203	BB/ICT
23	Matrix diagram Presentation by students about application of new tools in day-to-	R1, Ch 7 pg 205-209	BB/ICT
24	Prioritization matrix.	R1, Ch 7 pg 209-211	BB/ICT
25	Process decision program chart	R1, Ch 7 pg 212-214	BB/ICT
26	Activity network diagram	R1, Ch 7 pg 215-216	BB/ICT
27	Brainstorming session about possible solutions for industrial problems- Participative learning	NA	BB/ICT

Content beyond syllabus covered (if any): Use of new management tools in service sectors

* Session duration: 50 mins

* ICT – Laptop, Projector, Pen drive, Google Classroom, Microsoft tools, YouTube Videos



Sub. Code / Sub. Name: OE 18004 / Quality Concepts and tools

Unit : IV

Unit Syllabus: Quality Function Deployment (QFD) - FMEA – Stages and types - PDCA/ PDSA – Design of Experiments (DOE) - Six sigma – DMAIC – DMADV – Case studies in manufacturing and service industries.

Objective: To learn quality planning tools and its application in industries.

Session No *	Topics to be covered	Ref	Teaching Aids
28	Quality techniques & its importance	R3, ch9, Pg 91 – 94	BB/ICT
29	Quality Function Deployment (QFD)	R3,ch9 , Pg 95 – 109	BB/ICT
30	FMEA– Stages and types	R3,ch9, pg 110 – 114	BB/ICT
31	PDCA/ PDSA Demonstration with YouTube videos about how PDCA/PDSA system works	R3,ch9, pg 115 –121	BB/ICT
32	Design of Experiments (DOE)	R3,ch9, pg 121 –129	BB/ICT
33	Six sigma	R3,ch9, pg 136 –138	BB/ICT
34	DMAIC	R3,ch9, pg 142 –143	BB/ICT
35	DMADV	R3,ch9, pg 146-155	BB/ICT
36	Case studies in manufacturing and service industries.	R3,ch9, pg 91 – 94	BB/ICT

Content beyond syllabus covered (if any):

* Session duration: 50 mins

* ICT – Laptop, Projector, Pen drive, Google Classroom, Microsoft tools, YouTube Videos



Sub. Code / Sub. Name: OE 18004 / Quality Concepts and tools

Unit : V

Unit Syllabus: Lean – definition – wastes - Value Stream Mapping (VSM) – Kanban system – Kaizen -Takt Time -5S- Poka Yoke – One piece flow – Jidoka – Heijunka – Hoshin Kanri – Gemba – Bottleneck and JIT.

Objective: To study lean management concepts and techniques

Session No *	Topics to be covered	Ref	Teaching Aids
37	Introduction to Lean management	T1 ,ch11 pg 22- 27	BB/ICT
38	Lean – definition,	T1,ch11 pg 167-79	BB/ICT
39	wastes - Value Stream Mapping (VS	T1 ,ch11 pg 180-91	BB/ICT
40	Value stream Engineering Case study discussion of industrial problem using VSM – Participative learning	T1 ,ch11 pg 192-95	BB/ICT
41	Kanban system	T1 ,ch11 pg 141-50	BB/ICT
42	Kaizen -Takt Time	T1 ,ch11 pg 210-13	BB/ICT
43	5S- Poka Yoke	T1 ,ch11 pg 214-17	BB/ICT
44	One piece flow – Jidoka – Heijunka	T1 ,ch11 pg 219-23	BB/ICT
45	Hoshin Kanri – Gemba	T1 ,ch11 pg 220-23	BB/ICT
46	Bottleneck and JIT.	T1 ,ch11 pg 225-28	BB/ICT
Content beyond syllabus covered (if any): LICIOUS- Case study discussion, AMAZON- last mile delivery for logistics, VSM in wheel assembly			

* Session duration: 50 mins



* ICT – Laptop, Projector, Pen drive, Google Classroom, Microsoft tools, YouTube Videos

**TEXT BOOK:**

1. Peter Mears, "Quality Improvement tools and Techniques", McGraw-Hill, 1995

REFERENCES:

1. Amitava Mithra, "Fundamentals of Quality control and Improvement", Wiley, Third Edition, 2008

	Prepared by	Approved by
Signature		
Name	K. Ram Prasad	Dr. M. Mohandass
Designation	Assistant Professor	Asst HOD & Associate Professor
Date	20/12/23	20/12/23
Remarks *:		
Remarks *:		

* If the same **lesson plan** is followed in the subsequent semester/year it should be mentioned and signed by **the Faculty** and the HOD