

Automotive Quality Assurance

Code: MK3MINBG04G317-EN

ECTS Credit Points: 4

Evaluation: exam

Year, Semester: 3rd year, 1st semester

Its prerequisite(s): Automotive Process Analysis and Planning I

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2+2

Topics:

This course is an introduction to automotive quality assurance (IATF 16949). The students learn about PFMEA, DFMEA, CP, CPK, CMK, Gage R and R, SPC and the first sample approval process. The lectures describe the main properties of APQP processes, control plans, flow charts and 8D documentation (quality complaint handling) like problem solving techniques and measuring methods. One of the goals is to deepen the students' understanding of brainstorming, 5 why and pareto analysis by the middle of the semester. The focus of the course is on how to create the quality management handbook and how to review the management handbook processes and documentation. By the end of the semester the students will acquire and will be able to use these kinds of methods.

Literature:

Compulsory:

- Roland Mader, Eric Armengaud, Gerhard Griessnig, Christian Kreiner, Christian Steger, Reinhold Weiss: Reliability Engineering & System Safety, December 2013. ISSN 0951-8320
- Hervé Ressencourt, Louise Trave-Massuyes, Jérôme Thomes: Fault Detection, Supervision and Safety of Technical Processes 2006, Volume 1, 2007. ISBN 978-0080-0444-857
- Salman Taghizadegan: Essentials of Lean Six Sigma, 2006, Pages 107-174. ISBN 978-0080-4623-325

Recommended:

- Ali Jahan, Kevin L. Edwards: Multi-criteria Decision Analysis for Supporting the Selection of Engineering Materials In Product Design, 2013. ISBN 978-0081-0053-61
- Radley M. Smith, Roderick A. Munro, Ronald J. Bowen: The ISO/TS 16949 Answer Book: A Step-by-step Guide for Automotive Suppliers, Paton Professional, 2004. ISBN 1-932828-00-1

Schedule

1 st week Registration week	
2nd week: Lecture: Lean Manufacturing, Wates, Lean Terminology and Metrics Practice: KPI numbers of Quality, Supplier Evaluation	3rd week: Lecture: TQM, Definition of Quality, Elements for Success, History of QM Practice: Case studies about different quality systems
4th week: Lecture: 5S method, 5+1S, Plant Layouts Practice: 7 wastes	5th week: Lecture: Continuous Improvement, Kaizen Practice: PDCA, Idea Management System
6th week:	7th week: Lecture: IATF 16949, Certification, VDA 6.3

Lecture: ISO system, Definition of Standards, ISO 9000, ISO 9001

Practice: General Management Systems

8th week: 1st drawing week

9th week:

Lecture: Techniques to Support IATF 16949, Statistical Analysis, SPC, Measurement System Analysis, MSA

Practice: SPC and MSA Calculation

11th week:

Lecture: Problem Solving Techniques, Fishbone (Ishikawa) diagram, 5W2H

Practice: Problem Solving Techniques case studies

13th week:

Lecture: Production Part Approval Process, PPAP

Practice: Production Part Approval Process documentations

Practice: Comparing IATF 16949 with ISO 9001

10th week:

Lecture: Techniques to Support IATF 16949, Failure Modes & Effects Analysis, FMEA, Control Plans

Practice: FMEA example, Control Plan example

12th week:

Lecture: Quality Complaints, 3D and 8D documents

Practice: Quality Complaint process, 8D report

14th week:

Lecture: Capability indices, CP, CPK, PPK

Practice: CP, CPK, PPK calculation

15th week: 2nd drawing week

Requirements

A, for a signature: Attendance at lectures is recommended, but not compulsory. Participation at practice is compulsory. Students must attend the practice classes and may not miss more than three occasions during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't make up a practice with another group. Attendance at practice classes will be recorded by the practice leader. Being late is counted as an absence. In case of further absences, a medical certificate needs to be presented. Missed practice classes should be made up for at a later date, being discussed with the tutor. Active participation is evaluated by the teacher in every class. If a student's behaviour or conduct doesn't meet the requirements of active participation, the teacher may evaluate his/her participation as an absence because of the lack of active participation in class. During the semester there are two tests: the mid-term test in the 8th week and the end-term test in the 15th week. Students have to sit for the tests.

B, for grade: The course ends in an exam grade (ESE). The grade for the test is given according to the following table: Score Grade 0-59 fail (1) 60-69 pass (2) 70-79 satisfactory (3) 80-89 good (4) 90-100 excellent (5)