**Lesson Plan**

Name of the Faculty : Ravi kant

Discipline : Mechanical Engg.

Semester : 6th

Subject : IQC

Lesson plan duration : 15 weeks (from February, 2024 to June, 2024)

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| **Week** | **Theory** | **Practical**  |
| Lecture Day | Topic (including assignments /tests) | Practical Day | Topic  |
| 1st Week | 1st  | **Inspection**: Introduction, units of measurement, | 1st  | Introduction to the subject, why we should study it? |
| 2nd  | standards for measurement and interchangeability  | 2nd  | Applications in industry, Scope, factors affecting it. |
| 3rd | International, national and company standard, line and wavelength standards  |
| Week 2 | 1st  | Planning of inspection: what to inspect? When to inspect? Who should inspect? Where to inspect? | 1st  | Use of dial indicator for measuring taper. |
| 2nd  | Types of inspection: remedial, preventive and operative inspection,  | 2nd | Use of dial indicator for measuring taper / practical sessions |
| 3rd | Incoming, in-process and final inspection. |
| Week 3 | 1st  | Study of factors influencing the quality of manufacture  | 1st | Practice & VIVA |
| 2nd  | **Measurement and Gauging** : Basic principles used in measurement and gauging,  |
| 3rd | Principles: mechanical, optical, electrical and electronic.. | 2nd | Use of combination set for measuring taper |
| Week 4 | 1st  | Study of various measuring instruments like: calipers, micrometers, dial indicators surface plate, straight edge, try square, protectors, sine bar, clinometer | 1st  | Use of combination set for measuring taper / practical sessions |
| 2nd  | Comparators – mechanical, electrical and pneumatic. |
| 3rd | Slip gauges, tool room microscope, profile projector  | 2nd  | Use of bevel protector for measuring taper |
| Week 5 | 1st  | Limit gauges: plug, ring, snap, taper, thread, height, depth, form, feeler, wire | 1st  | Use of bevel protector for measuring taper / practical sessions |
| 2nd  | applications for linear, angular, surface, thread and gear measurements, gauge tolerances  |
| 3rd | **Geometrical parameters and errors:**Errors & their effect on quality, concept of error. | 2nd  | Use of sine bar for measuring taper / practical sessions |
| Week 6 | 1st  | measurement of geometrical parameter such as straightness, flatness and parallelism  | 1st  | Measurement of thread characteristic using vernier  |
| 2nd  | Study of procedure for alignment tests on lathes, drilling and milling machines  |
| 3rd | Testing and maintenance of measuring instruments | 2nd  | Measurement of thread characteristic using vernier / Practical Sessions |
| Week 7 | 1st  | Test  | 1st  | Use of slip gauge in measurement of center distance between two pins. |
| 2nd  | **Statistical Quality Control**: Basic statistical concepts |
| 3rd  | empirical distribution and histograms |
| Week 8 | 1st  | frequency, mean, mode, standard deviation,  | 1st  | Use of tool maker’s microscope and comparator |
| 2nd  | normal distribution, binomial and Poisson  |
| 3rd | Simple Problems on distribution  | 2nd  | Use of tool maker’s microscope and comparator / Practical Sessions |
| Week 9 | 1st  | Introduction to control charts X, R Charts  | 1st  | Plot frequency distribution for 50 turned components. |
| 2nd  | P and C charts & Applications |
| 3rd | Assignment on Control Charts | 2nd  | Plot frequency distribution for 50 turned components. / Practical Session |
| Week 10 | 1st  | Sampling plans, selection of sample size, method of taking samples, frequency of samples  | 1st  | Practice & VIVA |
| 2nd  | Inspection plan format and test reports  |
| 3rd | **Modern Quality Concepts**: Concept of total quality management (TQM)  | 2nd  | With the help of given data, plot X Chart |
| Week 11 | 1st  | National and International Codes. | 1st  | With the help of given data, plot X Chart / Practical Session |
| 2nd  | ISO-9000, concept and its evolution  |
| 3rd | QC tools  | 2nd  | With the help of given data, plot R Chart |
| Week 12 | 1st  | Introduction to Kaizen, 5S  | 1st  | With the help of given data, plot R Chart / Practical Session |
| 2nd  | Assignment on TQM, QC tools |
| 3rd | Revision | 2nd  | With the help of given data, plot P Chart  |
| Week 13 | 1st  | **Instrumentation**: Measurement of mechanical quantities  | 1st  | With the help of given data, plot P Chart / Practical Session |
| 2nd  | Displacement- by electro mechanical transducers,  |
| 3rd | Vibration- by electro mechanical transducers | 2nd  | With the help of given data, plot C Chart  |
| Week 14 | 1st  |  Frequency- by electro mechanical transducers | 1st  | With the help of given data, plot C Chart / Practical Session |
| 2nd  | Pressure, temperature- by electro mechanical transducers  |
| 3rd | Types of Electro Mechanical Transducers: resistance,  | **2nd** | Measurement of thread characteristic using Gauges |
| Week 15 | 1st  | capacitance type | **1st**  | Measurement of thread characteristic using Gauges / Practical Sessions |
| 2nd  | inductance type |
| 3rd | Revision | **2nd**  | Practice & VIVA |