**USHA RAMA COLLEGE OF ENGINEERING AND TECHNOLOGY**

*Department of Mechanical Engineering*

**LESSON PLAN::C0301**

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| **Academic Year** : 2016-17 | **Sem**  : I |
| **Course**: metrology | |
| **Class** : III B.TECH | **Section** : ME A&B |
| **Date of commencement of Class work** :13/06/2016 | **Date of end of Class work** : 08/10/2016 |
| **Prepared By**:ch.venkatakrishna, Assistant Professor | **Approved By**: HOD |

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| **Lecture**  **No** | **Date (As per Academic calendar)** | **Topics to be covered** | **Actual**  **Dateof completion** | **Remarks** |
| 1 | **13.6.16** | **UNIT-I**  **SYSTEMS OF LIMITS AND FITS INTRODUCTION:** |  |  |
| 2 | **14.6.16** | Normal size and tolerance |  |  |
| 3 | **15.6.16** | Limits and deviation |  |  |
| 4 | **16.6.16** | Fit-unilateral and bilateral tolerance system |  |  |
| 5 | **17.6.16** | Hole and shaft basis system |  |  |
| 6 | **18.6.16** | interchangeability |  |  |
| 7 | **20.6.16** | Deterministic and statistical tolerance. |  |  |
| 8 | **21.6.16** | Selective assembly |  |  |
| 9 | **22.6.16** | International standard system of tolerance |  |  |
| 10 | **23.6.16** | Selection of limits for correct functioning |  |  |
| 11 | **24.6.16** | Selection of tolerance for correct functioning |  |  |
| 12 | **25.6.16** | **UNIT-II**  **LINEAR MEASUREMENT:** Length standards |  |  |
| 13 | **27.6.16** | End standards |  |  |
| 14 | **28.6.16** | Dial indicators |  |  |
| 15 | **29.6.16** | micrometres |  |  |
| 16 | **30.6.16** | Different methods of angles |  |  |
| 17 | **01.7.16** | Bevel protractor |  |  |
| 18 | **02.7.16** | Angle slip gauges |  |  |
| 19 | **04.07.16** | Angle dekkor |  |  |
| 20 | **05.7.16** | Sprit levels |  |  |
| 21 | **07.7.16** | Sign bars |  |  |
| 22 | **08.7.16** | Sign table |  |  |
| 23 | **09.7.16** | Rollers used to measure angles and tapers |  |  |
| 24 | **11.7.16** | Spheres used to measure angles and tapers |  |  |
| 25 | **12.7.16** | Taylor’s principle |  |  |
| 26 | **13.7.16** | Design of go and no go gauges |  |  |
| 27 | **14.7.16** | Plug and ring |  |  |
| 28 | **15.7.16** | Snap ,gap and taper |  |  |
| 29 | **16.7.16** | Profile and position gauges |  |  |
| 30 | **18.7.16** | **UNIT-III**  **OPTICAL MEASURING INSTRUMENTS:** Tools maker microscope and uses |  |  |
| 31 | **19.7.16** | autocollimators |  |  |
| 32 | **20.7.16** | Optical projector |  |  |
| 33 | **21.7.16** | Optical flats and uses |  |  |
| 34 | **22.7.16** | Interference of light |  |  |
| 35 | **23.7.16** | Michelson’s interferometer |  |  |
| 36 | **25.7.16** | NPL flatness interferometer |  |  |
| 37 | **26.7.16** | NPL gauge interferometer |  |  |
| 38 | **27.7.16** | Revision |  |  |
| 39 | **28.7.16** | Revision |  |  |
| 40 | **29.7.16** | Revision |  |  |
| 41 | **30.7.16** | Revision |  |  |
| 42 | **01.8.16** | Revision |  |  |
| 43 | **02.8.16** | Revision |  |  |
| 44 | **03.8.16** | Revision |  |  |
| 45 | **04.08.16** | Revision |  |  |
| 46 | **05.08.16** | Revision |  |  |
| 47 | **06.8.16** | Revision |  |  |
|  | **08.8.16 To13.8.16** | MID EXAMINATIONS-I |  |  |
| 48 | **16.8.16** | **UNIT-IV**  **SURFACEROUGHNESSMEASUREMENT:** Difference between surface roughness and surface waviness |  |  |
| 49 | **17.8.16** | Numerical assessment of surface finish |  |  |
| 50 | **18.8.16** | CLA Rt, R.M.S.Rz |  |  |
| 51 | **19.8.16** | R10 values |  |  |
| 52 | **20.8.16** | Method of Measurement of surface finish-profilograph |  |  |
| 53 | **22.8.16** | Talysurf ,ISI symbols for indication of surface finish |  |  |
| 54 | **23.08.16** | Types of comparators |  |  |
| 55 | **24.08.16** | Mechanical comparators |  |  |
| 57 | **26.8.16** | Optical comparators |  |  |
| 58 | **27.8.16** | Electrical comparators |  |  |
| 59 | **29.8.16** | Electronic comparators |  |  |
| 60 | **30.08.16** | Pneumatic comparators and their uses |  |  |
| 61 | **31.08.16** | **UNIT – V**  **GEAR MEASUREMENT**  Tooth thickness measurement with gear tooth venire. |  |  |
| 62 | **1.9.16** | Tooth thickness measurement with flange micrometre |  |  |
| 63 | **2.9.16** | Pitch measurement |  |  |
| 64 | **3.9.16** | Total composite error |  |  |
| 65 | **06.09.16** | Tooth to tooth composite error |  |  |
| 66 | **07.9.16** | Rolling gear tester |  |  |
| 67 | **8.9.16** | Involutes profile checking |  |  |
| 68 | **09.9.16** | Elements of measurement |  |  |
| 69 | **10.9.16** | **Errors in screw threads** |  |  |
| 70 | **13.9.16** | Concept of virtual effective diameter |  |  |
| 71 | **14.9.16** | Measurement of effective diameter |  |  |
| 72 | **15.9.16** | Angle of thread and thread pitch |  |  |
| 73 | **16.9.16** | Pitch thread gauges |  |  |
| 74 | **17.9.16** | **UNIT – VI**  **FLATNESS MEASUREMENT**  Measurement of flatness of surfaces |  |  |
| 75 | **19.9.16** | Instruments used for measurement of surfaces |  |  |
| 76 | **20.9.16** | Straight edges |  |  |
| 77 | **21.9.16** | Surface plates |  |  |
| 78 | **22.9.16** | Auto collimetre |  |  |
| 79 | **23.9.16** | Principles of machine tools alignment on lathe machine |  |  |
| 80 | **24.9.16** | Principle of machine tools alignment on drilling machine |  |  |
| 81 | **26.9.16** | Principle of machine tools alignment on milling machine |  |  |
| 82 | **27.9.16** | Revision |  |  |
| 83 | **28.9.16** | Revision. |  |  |
| 84 | **01.10.16** | Revision |  |  |
| 85 | **03.10.16** | Revision |  |  |
| 86 | **04.10.16** | Revision |  |  |
| 87 | **05.10.16** | Revision |  |  |
| 88 | **06.10.16** | Revision |  |  |
| 89 | **07.10.16** | Revision |  |  |
| 90 | **08.10.16** | Revision |  |  |
|  | **10.10.16 To 15.10.16** | Mid Exams-II |  |  |

**TEXT BOOKS:**

1. Engineering Metrology by R.K.Jain / Khanna Publishers
2. Engineering Metrology by Mahajan / Dhanpat Rai Publishers

**REFERENCES:**

1. Dimensional Metrology, Connie Dotson, Cengage Learning.
2. Engineering Metrology by I.C.Gupta / Dhanpat Rai Publishers.
3. Precision Engineering in Manufacturing by R.L.Murthy / New Age.
4. Engineering Metrology and Measurements by NV Raghavendra, L Krishna murthy, Oxford publishers.

Engineering Metrology by KL Narayana, Scitech publishers

**List the Course Outcomes (Cos):**

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| Sub code | Sub Name | COs | Expected level of attainment  On 5 scale |
|  | **METROLOGY** | 1. Inspection of engineering parts with various precision instruments.  2. Design of part, tolerances and fits components in a gas power plant.  3 Principles of measuring instruments and gauges and their uses.  4. Inspection of spur gear and thread elements. | 3.5  3.5  3.5  3.5 |

**Signature of faculty Head of the Department**