**Lesson Plan**

**Subject : Non-Destructive Testing (MEO-405A)**

Lesson plan Duration : 15 Weeks

Work load (lecture/Practical) per week: Lectures: 3 hours

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| **Lecture No** | **Description** |
| 1 | Brief introduction of Cos and Pos |
| 2 | Unit1: NDT vs destructive testing |
| 3 | Overview of the don-destructive |
| 4 | Testing methods for the detection of manufacturing defects as well as material characterization |
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| 6 | Relative merits and limitations of NDT |
| 7 | Various physical characteristics of materials and their applications in NDT |
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| 9 | Visual inspection – unaided and aided |
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| 11 | Unit 2: Introduction of Surface NDE methods |
| 12 | Liquid penetrant testing |
| 13 | Types and properties of liquid penetrants |
| 14 | Principles developers |
| 15 | Advantages and limitations of various methods |
| 16 | Testing procedure, interpretation of results |
| 17 | Magnetic particle testing |
| 18 | Theory of magnetism, inspection materials |
| 19 | Magnetization methods, interpretation and evaluation of test Indications |
| 20 | Principles and methods of demagnetization |
| 21 | Residual magnetism |
| 22 | Unit 3:Thermography and eddy current testing (ET) |
| 23 | Thermography- principles |
| 24 | Contact and non-contact  inspection methods |
| 25 | Techniques for applying liquid crystals |
| 26 | Infrared radiation  and infrared detectors, |
| 27 | Advantages and limitations,  Instrumentations and methods, applications, |
| 28 | Eddy current testing |
| 29 | Generation of eddy currents, properties of eddy currents |
| 30 | Eddy current sensing elements |
| 31 | Probes, instrumentation, types of arrangement |
| 32 | Applications, advantages, limitations, interpretation/evaluation |
| 33 | Unit 4: Ultrasonic testing (UT) and acoustic emission (AE) |
| 34 | Transducers, transmission and pulse-echo method |
| 35 | Straight beam and angle beam, instrumentation |
| 36 | Data representation, A/Scan |
| 37 | B-scan, C-scan |
| 38 | Phased array ultrasound |
| 39 | Time of flight diffraction, |
| 40 | Introduction of acoustic emission technique |
| 41 | Acoustic emission technique–principle, AE parameters, applications. |
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