

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Department of Metallurgical and Materials Engineering

| COURSE OUTLINE | | | |
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| Course Code Title & Course Title | MTLR15 HEAT TREATMENT LABORATORY | | |
| Programme & Semester | B.Tech & V | No. of Credits | 01 |
| Department | MME | Faculty | Dr. P.Venkatachalam |
| Pre - requisites Course Code | MTPC18 | | |
| Course Coordinator(s) (if, applicable) | --- | | |
| Other Course Teacher(s)/Tutor(s) E-mail | venkatp@nitt.edu | Telephone No. | 8220931481 |
| Course Type | ELR | | |
| COURSE OVERVIEW | | | |
| <p>Practical experience on Heat treatment of plain carbon and alloy steels: Annealing, normalising, hardening and tempering. Determination of grain size in microstructure. Heat treatment procedures for non-ferrous alloys. Tutorials for introducing important aspects of heat treatment.</p> | | | |
| COURSE OBJECTIVES | | | |
| <p>To develop the knowledge of heat treatment and associated procedure of various engineering materials and apply them to study how it influences the microstructure and results in different mechanical behavior.</p> | | | |
| COURSE OUTCOMES (CO) | | | |
| Course Outcomes | Aligned Programme Outcomes (PO) | | |
| 1. Define various heat treatment procedures for variety of engineering materials and their importance in materials behavior | [1, 2] | | |

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| 2. Classify different heat treated microstructure using microscope 3. Provide the practical solution procedure for the betterment of the materials performance based heat treatment | [1, 2, 10] |
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COURSE TEACHING AND LEARNING ACTIVITIES

| S.No. | Week | Topic | Mode of Delivery |
|-------|-----------------------|---|-----------------------------|
| 1. | 1 st week | Introduction to Heat treatment laboratory. Responsibilities and safety precautions | Chalk and talk Practical |
| 2. | 2 nd week | Metallography – sample preparation practice | |
| 3. | 3 rd week | Heat treatment of mild, medium carbon and alloy steels and Procedure for grain size measurements. | |
| 4. | 4 th week | Microstructural evaluation of Normalized steel | |
| 5. | 5 th week | Microstructural evaluation of Annealed steel | |
| 6. | 6 th week | Microstructural evaluation of Oil quenched steel | |
| 7. | 7 th week | Microstructural evaluation of Water quenched steel | |
| 8. | 8 th week | Microstructural evaluation of Duplex stainless steel | |
| 9. | 9 th week | Microstructural evaluation of Copper | |
| 10. | 10 th week | Microstructural evaluation of Aluminium | |

COURSE ASSESSMENT METHODS

| S.No. | Mode of Assessment | Week/Date | Duration | % Weightage |
|-------|---|--|----------|-------------|
| 1. | Assessment I (Record, observation, assignment and lab experiment) | 1 st to 10 th week | 30 hrs | 75% |
| 2. | Assessment II (End practical examinations and viva) | 11 th week | 3hrs | 25% |

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc**Text Books:**

1. T.V. Rajan, C.P. Sharma and A. Sharma, Heat Treatment Principles and Techniques, Prentice Hall of India, New Delhi, 1998.
2. ASM Handbook, Vol.4, Heat Treating, ASM Int., Ohio, 1991

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

1. An exist survey will be taken from the student at the end of the semester through a questionnaire on coverage of lab syllabus, usefulness of course plan, lab manual, practical teaching efficiency, etc
2. The feed back collected from the students is to be used for improvement of the lab in the future semesters

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)**1.Examination**

1. Attending all the assessments is compulsory for every student.
2. If any student is not able to attend any of the Lab session due to genuine reason, student is permitted to attend the compensation lab at the end of the 10th week.

3. Students should submit one assignment on selective topics related to this lab at the end of the 10th week.
4. The relative grading guidelines will followed and passing mark will be assigned as per Institute norms.

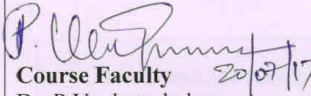
2.Attendance


Students should have minimum 75% attendance for completing the lab course

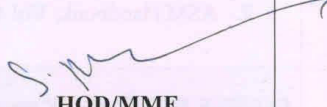
ADDITIONAL COURSE INFORMATION

1. Students can make a call or email to venkatp@nitt.edu at any stage of the course duration in case he/she finds difficulty in understanding the practical concepts.

FOR SENATE'S CONSIDERATION


Course Faculty 20/07/17
Dr. P. Venkatachalam


CC-Chairperson
Dr. S. Jerome


HOD/MME
Dr. S. P. Kumaresh Babu



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