| Discipline: **Metallurgical Engineering** | | Semester: **5th semester** | Name of the Teaching Faculty: ARABINDA NAYAK | | |
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| Subject: **Heat Treatment Technology** | | No of days /week class allotted:**05** | Semester from Date:_____ to _____ | | |
| Month | week | Class Day | Theory topics | %covered | Remark |
| July | 5th | 1st | Explain Solid state diffusion | | |
| | | 2nd | Explain Fick's law | | |
| Aug | 1st | 1st | Austenite formation | | |
| | | 2nd | Explain Austenite mechanism | | |
| | | 3rd | Explain Austenite grain size | | |
| | 2nd | 1st | Explain grain size importance | | |
| | | 2nd | Explain grain size measurement and control | | |
| | | 3rd | Explain pearlite transformation | | |
| | | 4th | Explain bainite transformation | | |
| | | 5th | Explain martensite transformation | | |
| | 3rd | 1st | Explain TTT diagram | | |
| | | 2nd | Explain CCT diagram | | |
| | | 3rd | Explain annealing process | | |
| | | 4th | Explain types of annealing | | |
| | 4th | 1st | Explain objective of annealing | | |
| | | 2nd | Explain normalizing process | | |
| | | 3rd | Explain hardening process | | |
| | | 4th | Explain quenching mechanism | | |
| | | 5th | Explain sub zero treatment process | | |
| | 5th | 1st | Explain about different quechants | | |
| | | 2nd | Explain tempering process | | |
| | | 3rd | Explain thermo mechanical treatment | | |
| | | 4th | Explain different tempering process(aus tempering and martempering) | | |
| | | 5th | Explain hardenability | | |
| Sept | 1st | 1st | Explain gross man's method | | |
| | | 2nd | Explain jominey end quench method | | |
| | | 3rd | Explain Factors affecting hardenability | | |
| | | 4th | Explain Estimation of hardenability | | |
| | 2nd | 1st | Explain Estimation of hardenability | | |
| | | 2nd | Explain about concept of surface hardening | | |
| | | 3rd | Explain factors affecting surface hardening | | |
| | | 4th | Explain high frequency induction hardening | | |
| | | 5th | Flame and electron beam hardening | | |
| | 3rd | 1st | Explain laser hardening method | | |
| | | 2nd | Explain case depth measurement of steel | | |
| | | 3rd | Explain concept of carburizing process | | |
| | | 4th | Explain pack carburizing | | |
| | | 5th | Explain liquid carburizing | | |
| | 4th | 1st | Explain gas carburizing | | |
| | | 2nd | Explain vacuum carburizing | | |
| | | 3rd | Explain post carburizing treatment | | |
| | | 4th | Explain nitriding process of steel | | |

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| | | 5th | Explain cyaniding process | | |
| | 5th | 1st | Explain carbo-nitriding process | | |
| OCT | 1st | 1st | Explain Plasma nitriding process | | |
| | 2nd | 1st | Explain Nitro carburising | | |
| | | 2nd | Explain Nitro carburising | | |
| | 3rd | 1st | Explain Boronising process | | |
| | | 2nd | Explain Chromizing process | | |
| | | 3rd | Explain Toyato diffusion process | | |
| | | 4th | Explain Requirements of age hardening | | |
| | | 5th | Explain Steps in age hardening | | |
| | 4th | 1st | Explain Types of precipitates form | | |
| | | 2nd | Explain Precipitation sequence | | |
| | | 3rd | Explain Types of GP Zones | | |
| | | 4th | Explain Kinetics of precipitation | | |
| | | 5th | Explain Hardening mechanism | | |
| | 5th | 1st | Explain Internal strain hardening | | |
| | | 2nd | Explain Dispersion hardening | | |
| | | 3rd | Explain Chemical hardening | | |
| NOV | 1st | 1st | Explain concept of different alloy steel | | |
| | | 2nd | Explain types of tool steel | | |
| | 2nd | 1st | Explain requirement of tool steel | | |
| | | 2nd | Explain cold work and hot work tool steel | | |
| | | 3rd | Explain water hardening steel | | |
| | | 4th | Explain shock resisting steel | | |
| | | 5th | Explain mold steel | | |
| | 3rd | 1st | Discuss about alloying elements in tool steel | | |
| | | 2nd | Explain effect of alloying elements | | |
| | | 3rd | Explain effect of alloying elements | | |
| | | 4th | Explain high speed steel | | |
| | | 5th | Explain Types of HSS | | |
| | 4th | 1st | Explain Function of various alloying elements in HSS | | |
| | | 2nd | Explain about Stainless steel | | |
| | | 3rd | Explain about HSLA Steel | | |