# Lesson Plan

Name of Institute : Ambala College of Engineering and Applied Research
Name of the Faculty member : Ashwani Verma (Assistant Professor)
Discipline : Mechanical Engineering
Semester : 8th
Subject : Metal Forming and Finishing (ME-434 N)
Lesson Plan Duration : 15 weeks (from January 2020 to April 2020)
Work Load : L-4 T-0 P-0

| Week | Theory | | Practical | |
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| | Lecture day | Topic (including assignment/test) | Practical day | Topic |
| 1st | 1st | UNIT-I **Bulk Deformation Processes**: Introduction Elastic and plastic deformation. | 1st | |
| | 2nd | Concept of strain hardening. | 2nd | |
| | 3rd | Hot and cold working processes -rolling, forging, extrusion, swaging, wire and tube drawing. | 3rd | |
| | 4th | Machines and equipment for the processes. | 4th | |
| 2nd | 5th | Parameters and force calculations (rolling process). | 5th | |
| | 6th | Parameters and force calculations (rolling process). | 6th | |
| | 7th | Parameters and force calculations (forging process). | 7th | |
| | 8th | Parameters and force calculations (forging process). | 8th | |
| 3rd | 9th | Parameters and force calculations (wire drawing process). | 9th | |
| | 10th | Parameters and force calculations (tube drawing process). | 10th | |
| | 11th | Parameters and force calculations (extrusion process). | 11th | |
| | 12th | Class Test-1 | 12th | |
| 4th | 13th | Test methods for formability, Basics of plastic forming & forging. | 13th | |
| | 14th | Mechanics of metal working. | 14th | |
| | 15th | Temperature in metal working. | 15th | |
| | 16th | Strain rate effects, friction and lubrication, deformation zone geometry. | 16th | |
| 5th | 17th | Forging process, classification – equipment. | 17th | |
| | 18th | Calculation of forging loads. | 18th | |
| | 19th | Forging defects, residual stresses, Assignment. | 19th | |
| | 20th | **TEST-1** | 20th | |
| 6th | 21st | UNIT-II **Sheet Metal Working**: Applications of sheet formed products. | 21st | |
| | 22nd | Shearing mechanism. | 22nd | |
| | 23rd | Processes like blanking, piercing, punching, trimming etc. | 23rd | |
| | 24th | Forming processes like bending, cup drawing, coining, embossing, etc. | 24th | |
| 7th | 25th | Presses for sheet metal working. | 25th | |
| | 26th | Presses for sheet metal working. | 26th | |
| | 27th | Part feeding systems. | 27th | |
| | 28th | Elements of die. | 28th | |
| 8th | 29th | Elements of die. | 29th | |
| | 30th | Punch and die clearances. | 30th | |

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| | 31st | Progressive die. | 31st | |
| | 32nd | Compound die. | 32nd | |
| 9th | 33rd | Combination die. | 33rd | |
| | 34th | Combination die. | 34th | |
| | 35th | High energy rate forming processes. | 35th | |
| | 36th | High energy rate forming processes, Assignment. | 36th | |
| 10th | 37th | Class Test-2 | 37th | |
| | 38th | UNIT-III **Metal finishing**: Technological importance of metal finishing. | 38th | |
| | 39th | Effect of plating variables on electro deposits. | 39th | |
| | 40th | Effect of plating variables on electro deposits. | 40th | |
| 11th | 41st | **TEST-3** | 41st | |
| | 42nd | Electroplating techniques. | 42nd | |
| | 43rd | Methods of electroplating. | 43rd | |
| | 44th | Surface preparation. | 44th | |
| 12th | 45th | Metal finishing processes: diamond machining. | 45th | |
| | 46th | Honing. | 46th | |
| | 47th | Lapping. | 47th | |
| | 48th | Buffing, Assignment. | 48th | |
| 13th | 49th | Class Test-3 | 49th | |
| | 50th | UNIT-IV **Powder Metallurgy:** Introduction. | 50th | |
| | 51st | Production of metal powders. | 51st | |
| | 52nd | Production of metal powders. | 52nd | |
| 14th | 53rd | Compaction and sintering processes. | 53rd | |
| | 54th | Compaction and sintering processes. | 54th | |
| | 55th | Secondary and finishing operations. | 55th | |
| | 56th | Secondary and finishing operations. | 56th | |
| 15th | 57th | Economics. | 57th | |
| | 58th | Advantages. | 58th | |
| | 59th | Applications of powder metallurgy, Assignment. | 59th | |
| | 60th | **TEST-3** | 60th | |

(Signature of the teacher concerned with date)