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| **Limestone Community High School** | | | | | |
| **small_lchs2.gif** | | **Welding 3,4**  **SYLLABUS**  **2010-2011** | | | **small_lchs2.gif** |
| **Instructor:** | Mr. Seals | | | | |
| **Classroom:** | #65 | | | | |
| **Planning Period:** | 5th Hour | | | | |
| **Office Phone:** | 309-697-6271 ext. 165 | | | | |
| **Email Address:** | shaneseeals@limestone.k12.il.us | | | | |
| **A. Course Information** | | | | | |
| **Grade Level:** | | | 11, 12 | | |
| **Prerequisite(s):** | | | Welding 1,2 | | |
| **Length of Course:** | | | One year | | |
| **B. Course Description** | | | | | |
| (Advanced Welding 3, 4 may be taken as a dual credit course.)  Advanced Welding 3, 4 is designed to further acquaint the students with advanced techniques in welding and set-up procedures. Various assembly procedures will also be discussed, as well as more advanced study of metallurgy. This course will also include welding blueprint reading. A materials fee will be assessed to each student. | | | | | |
| **C. Course Standards** | | | | | |
| (Advanced)  Standard 1: Workplace Basic Skills  Standard 2: Personal Skills  Standard 3: Critical Thinking Skills  Standard 4: Workplace Safety Skills  Standard 5: Advanced Welding Skills  Standard 6: Shielded Metal Arc Welding (SMAW) All Positions  Standard 7: Metal Inert Gas (MIG) All Positions  Standard 8: Oxy-Fuel Cutting/Heating/Welding All Positions (OAW)-(OFC)  Standard 9: Gas Tungsten Arc Welding (GTAW) Flat Position  Standard 10: Plasma Arc Cutting (PAC)  Standard 11: The student will demonstrate safe and proper use of metal fabricating tools.  Academic Mathematics Standards  Standard 1: The student will apply basic theorems of plane geometry, right triangle trigonometry, coordinate geometry and a variety of visualization tools to solve real-world and mathematical problems.  Academic Language Arts Standards  Standard 1: The student will read and understand grade-appropriate English language text and apply a variety of strategies to expand vocabulary.  Standard 2: The student will understand the meaning of informational, expository or persuasive texts, using a variety of strategies and will demonstrate literal, interpretive, inferential and evaluative comprehension.  Standard 3: The student will locate and use information in reference materials. | | | | | |
| **D. Course Benchmarks/Objectives/Goals/Topics** | | | | | |
| 1. The student will locate, understand and interpret written information through reading.  2. The student will communicate thoughts, ideas, information and messages through writing.  3. The student will perform basic computations and solve practical problems using mathematical techniques.  4. The student will organize ideas and communicate effectively through speaking.  5. The student will be able to produce a significant volume of work efficiently in a specified period of time.  6. The student will seek out new assignments and assume additional duties when necessary.  7. The student will demonstrate ability to work cohesively with superiors and classmates.  8. The student will demonstrate integrity, honesty, and confidentiality in choosing the ethical course of action.  5. The student will demonstrate a professional image by dressing appropriately for the occupation.  6. The student will show no problem with absenteeism, tardiness, or unexcused absences.  7. The student will adhere to classroom policies, rules and regulations.  8. The student will demonstrate independence by performing work with little or no supervision.  9. The student will demonstrate a professional attitude by showing a willingness to work.  10. The student will demonstrate problem solving skills by showing an ability to recognize problems and devise and implement a plan of action.  11. The student will demonstrate learning skills by applying new knowledge and skills.  12. The student will assume responsibility for the safety of self and others.  13. The student will wear protective safety clothing and equipment as required.  14. The student will maintain a clean and safe work environment to include work area, tools and equipment.  15. The student will comply with established safety policies.  16. The student will operate equipment/tools in a safe, prescribed manner.  17. The student will understand and apply procedures of health and safety.  18. The student will identify metals.  19. The student will properly select filler metal/electrode for the welding process.  20. The student will select and prepare appropriate materials for the task.  21. The student will read and interpret charts, graphs and tables.  22. The student will read, interpret and fabricate from a basic blueprint.  23. The student will measure, mark and cut materials accurately.  24. The student will understand basic welding terminology.  25. The student will select appropriate tools for the job.  26. The student will evaluate the quality of completed tasks.  27. The student will be aware of the liability aspect of welded projects.  28. The student will identify and maintain parts of the SMAW welder.  29. The student will select power source/set current for specific SMAW welding procedures.  30. The student will understand the welding positions—flat, horizontal, vertical and overhead.  31. The student will understand the welding joints—butt, fillet, lap, pipe, corner and multi pass.  32. The student will understand the SMAW electrodes—E6010, E6011, E6013, E7018, E Nickel, Hard Surfacing and Cast Iron.  33. The student will identify and maintain parts for GTAW welding.  34. The student will select power source/ set current and polarity for specific GTAW welding procedures.  35. The student will identify and maintain parts for GMAW welding.  36. The student will select power source/set current and wire speed for specific GMAW welding procedures.  37. The student will define GMAW wire—steel and aluminum.  38. The student will identify and maintain parts of OAW.  39. The student will select and set proper gas pressures for OAW.  40. The student will light and adjust flames for OAW.  41. The student will understand OAW welding rods—steel rod and bronze rod.  42. The student will understand OFC cutting—straight, bevel and circle/hole.  43. The student will understand PAC—straight, circle/hole, pattern and bevel.  44. The student will identify and maintain parts of the PAC.  45. The student will be able to set up PAC cutting equipment.  46. The student will be able to identify and show ability to use the following tools:  a. Metal Shear  b. Metal Punch  c. Drill Press  d. Portable Hand Drill  e. Metal Cutoff/Chop Saw  f. Metal Brake  g. Metal Horizontal Band Saw  h. Angle Grinders  i. Stationary Grinders  j. Hydraulic Press  k. Carbon Arc  Academic Mathematics Benchmarks  1. The student will know and use properties of two- and three-dimensional figures to solve real-world and mathematical problems such as : finding area, perimeter, volume and surface area; applying direct or indirect methods of measurement; the Pythagorean theorem and its converse; and properties of 45° -45°-90º and 30° -60° -90° triangles.  2. The student will apply the basic concepts of right triangle trigonometry including sine, cosine and tangent to solve real-world and mathematical problems.  3. The student will perform basic constructions with a straightedge and compass.  4. The student will draw accurate representations of planar figures using a variety of tools.  Academic Language Arts Benchmarks  1. The student will acquire, understand and use vocabulary by learning words through explicit vocabulary instruction and independent reading, and appropriately use these words in writing.  2. The student will determine the meaning of unfamiliar words and metaphors by using dictionaries, context clues and reference books.  3. The student will comprehend and evaluate the purpose, accuracy, comprehensiveness, and usefulness of informational materials.  4. The student will use print, electronic databases and online resources to access information, organize ideas, and develop writing. | | | | | |
| **E. Text and Required Supplies** | | | | | |
| **Textbook:** | | | Welding Technology Fundamentals | | |
| **Workbook:** | | | Welding Technology Fundamentals | | |
| **Supplies:** | | | Pen, pencil, notebook paper | | |
| **Supplemental Material:** | | | Class Fee $25.00, long pants, full foot and ankle covering shoes | | |
| **F. Nine-Weeks Term Grading Plan** | | | | | |
| Daily Grade**:** | | | | 50 % | |
| Tests**:** | | | | 20 % | |
| Quizzes, homework, writing Assignments**:** | | | | 10 % | |
| **:** | | | |  | |
| **:** | | | |  | |
| **:** | | | |  | |
| Term Assessments**:** | | | | 20% | |
| **G. Semester Grading Plan** | | | | | |
| Term 1: | | | | 50% | |
| Term 2: | | | | 50% | |
| **H. Limestone High School Grading Scale** | | | | | |
| A: | | | | 94-100 | |
| B: | | | | 86-93 | |
| C: | | | | 77-85 | |
| D: | | | | 70-76 | |
| **I. Expectations** | | | | | |
| 1. No passes. No passes will be issued unless it is doctor excused 2. No electronic devices. No electronic devices are to brought to class at any time 3. No food or beverage. Water only may be brought to class 4. Tardies are unacceptable. All tardies will be counted and participation points will be taken away for every tardy | | | | | |
| **J. Tentative Schedule** | | | | | |
| Term 1  1. Have an advanced understanding of all shop safety rules.  2. Further define various welding positions, joint design and welding terms.  3. Further troubleshoot common weld and weld-related discontinuities.  4. List components of arc welding machines and accessories along with troubleshooting.  5. Perform proper electrode operations for 6010, 6011, & 7018 S.M.A.W.  6. Weld a continuous bead using 6010, 6011, 6013 & 7018 (vert. Up, vert. Down, & overhead) S.M.A.W.  7. Weld a tie-in using 6010, 6011, 6013 & 7018 (vert. Up, vert. Down, & overhead) S.M.A.W.  8. Weld a square grove butt joint using 6010, 6011, 6013 & 7018 (vert. Up, vert. Down, & overhead) S.M.A.W.  9. Weld a v grove butt joint using 6010, 6011, 6013 & 7018 (vert. Up, vert. Down, & overhead) S.M.A.W.  10. Weld a u grove butt joint using 6010, 6011, 6013 & 7018 (vert. Up, vert. Down, & overhead) S.M.A.W.  Term 2  11. Weld a fillet weld lap joint using 6010, 6011, 6013 & 7018 (vert. Up, vert. Down, & overhead) S.M.A.W.  12. Weld an outside corner joint using 6010, 6011, 6013 & 7018 (vert. Up, vert. Down, & overhead) S.M.A.W.  13. Weld a fillet weld t-joint using 6010, 6011, 6013 & 7018 (vert. Up, vert. Down, & overhead) S.M.A.W.  14. Weld a 3 pass t-joint using 6010, 6011, 6013 & 7018 (vert. Up, vert. Down, & overhead) S.M.A.W.  15. Weld a single pass pad using 6010, 6011, 6013 & 7018 (vert. Up, vert. Down, & overhead) S.M.A.W.  16. Define various types of weld testing (destructive & non-destructive).  17. Demonstrate a face bend test on a butt joint using 6010, 6011, 6013 & 7018 (vert. Up, down, & overhead) S.M.A.W.  18. Demonstrate a root bend test on a butt joint using 6010, 6011, 6013 & 7018 (vert. Up, down, & overhead) S.M.A.W.  19. Define & troubleshoot oxy- acetylene welding and cutting equipment O.A.W. & O.F.C.  Term 3  20. Demonstrate various flame cutting principles and techniques O.F.C.  21. Set up, operate, & troubleshoot a mig welder G.M.A.W.  22. Define the variances between globular, short circuit, & spray mig welding G.M.A.W.  23. Weld a continuous bead (push & pull) using .035 70s-6 mig wire (vert. Up, vert. Down & overhead) G.M.A.W.  24. Weld a tie-in using (push & pull) .035 70s-6 mig wire (vert. Up, vert. Down, & overhead) G.M.A.W.  25. Weld a 3 layer pad 3”x3” using .035 70s-6 mig wire (vert. Up & vert. Down) G.M.A.W.  26. Weld a continuous weave using .035 70s-6 mig wire (vert. Up & vert. Down) G.M.A.W.  27. Weld a fillet weld lap joint using .035 70s-6 mig wire (vert. Up, vert. Down & overhead) G.M.A.W.  28. Weld a square grove butt joint using .035 70s-6 mig wire (vert. Up, vert. Down, & overhead) G.M.A.W.  29. Weld an outside corner joint using .035 70s-6 mig wire (vert. Up, vert. Down & overhead) G.M.A.W.  Term 4  30. Weld an edge joint using .035 70s-6 mig wire (vert. Up, vert. Down & overhead) G.M.A.W.  31. Weld a t-joint using .035 70s-6 mig wire (vert. Up, vert. Down & overhead) G.M.A.W.  32. Weld a thick to thin t-joint using .035 70s-6 mig wire (vert. Up, vert. Down & overhead) G.M.A.W.  33. Weld a 6 pass t-joint using .035 70s-6 mig wire (vert. Up & vert. Down) G.M.A.W.  34. Weld a butt joint (face bend test) using .035 70s-6 mig wire (vert. Up, vert. Down & overhead) G.M.A.W.  35. Weld a butt joint (root bend test) using .035 70s-6 mig wire (vert. Up, vert. Down & overhead) G.M.A.W.  36. Learn welding blueprint symbols and how they are used on industrial prints.  37. Perform assigned tasks using a variety of assembling techniques.  38. Have and understanding of when preheating and postheating are necessary.  39. Learn to set up and operate a carbon arc electrode holder.  40. Understand what it means to become a certified welder. (AWS) | | | | | |
| **K. Other** | | | | | |
| A rules and classrom guidline form must be signed and handed in to your instructor and a required shop safety test must meet or exceed a 94% before you can work with any welding shop equipment. | | | | | |