Kazo Technical School

Welding and Fabrication Course Syllabus
2022 Version

Course Information:

Course Name: Welding and Fabrication Course

After graduation: Certificate of Completion from *Kazo Technical School*;*DIT* examination

School location: Kazo, on Kawaala road next to St. Luke's church

Daily schedule: Monday-Friday 8:30 A.M.– 4:00 P.M.

Class size: 10-15 students

Duration: 2 semesters, 13 weeks per semester

Instructor Information:

1st Instructor: Tumuhairwe Timothy Kirabo

2nd Instructor: Rukundo Desire

Principal: Ssemwogerere Justus

Director: Gooch John

Office Location: Kazo, Kawaala road next to St. Luke's church

Office Hours: Monday-Friday, 8:30 A.M.- 4:00 P.M.

Office Phone: 0778 331 533/ 0750 188 330

Office Email: kazotechnicalschool@gmail.com

Website: http://www.theweldingschool-ug.com

Primary resource: *Lincoln Welding* Curricula

About us:

Kazo Technical School was founded with the purpose of equipping the youth of Uganda with the skills they need to provide for themselves and their dependents. This vocational institute is a project of *Followers of The Way*, an NGO based in Kampala with sponsorship from the USA. We and our sponsoring organisation are Christian non-profit institutions committed to the promulgation of the Christian faith and sustainable poverty solutions in developing countries.

Course Information:

Students are trained in basic arc welding and metal fabrication practices with an emphasis on high quality standards. The daily lesson plans allocate the learning time to approximately one-third theoretical in the classroom and two-thirds practical in the welding booths. The students are taught in the classroom as a group and then practice individually with a welding machine or other tools. Kazo Technical School will limit class size to no more than

15 students to allow for individual assistance by the instructor. The course will also include at least thirty minutes of daily instruction in the Christian principles of integrity, honesty, diligence, and morality. These fundamental life skills are essential for success and make the graduate that possesses them highly desirable as an employee.
The administrators retain the right to make changes to this syllabus as needed.

Course Goal:

By the end of the second semester students will be equipped with a wide variety of skills for the metal working industry in East Africa including heavy steel construction, food handling equipment, and small-scale local production of light steel products.

Course Objectives:

- Improve the skill level of workers in industry and increase the economic potential of the country.
- Provide industry with competent and professional workers,
- Provide technical and vocational training which reflects the requirements of Ugandan industry.

Competencies gained after completion of course:

After successful completion of this training, the trainee should be knowledgeable about:

- Fabrication skills, including applied arithmetic, geometric terminologies, and calculations for measuring, marking, cutting, filing, drilling metals of all sizes.
- Safety practices in the metal working industry
- The theory of Shielding Metal Arc Welding, Oxy Fuel Welding and Cutting, Gas Metal Arc Welding, Gas Tungsten Arc Welding and related welding processes
- Welding terminology
- Welding defects and their remedies
- Overview of 1G, 2G, 3G, and 4G welding positions
- Blueprint reading.
- Material and cost calculations.
- Entrepreneurial skills.
- Accounting skills.

After successful completion of this training, the trainee should be able to:

- Perform basic metalworking skills including measuring, marking, cutting, filing, grinding, drilling and countersinking
- Weld with the Shielded Metal Arc Welding, Gas Metal Arc Welding, Gas Tungsten Arc Welding and Oxyacetylene Welding processes on all types of joints in various positions
- Weld stainless steel plate and pipe using the GTAW process
- Fabricate a wide variety of welded projects, from simple to complex

- Cut, bend and join pipe of all sizes
- Braze the common metals

Modules:

(Each semester is 13 weeks in duration)

(Each module varies in duration as determined by the Instructor)

#	Module	Educational objectives
1	Student reporting, Orientation and Safety training	The student will understand safety standards, the hazards associated with the metal working industry, and will be able to properly use PPE.
2	Safety and Introduction to SMAW	The student will gain an understanding of all aspects of SMAW parameters (CLAMS) and equipment, and be able to apply that understanding to weld basic joints with the SMAW process.
3	Scale reading & Maths in welding	The student will understand how to read both the Metric and Imperial measurement scales and be able to convert between them. He will understand fractional maths and simple geometry and be able to apply these principles in the fabrication of projects.
4	Fabrication plans/Welding Specification Procedure(WPS)	The student will know how to accurately use measuring tools such as a ruler, squares, tape measure, callipers, compass, and protractor. He will be able to mark the location of cuts, holes, and other features of the fabrication. He will also be able to develop a cut list and follow a WPS.

5	Basic metalworking hand tools	The student will know how to properly use a hacksaw, various types of metal files, cold punch, centre punch, reamer, bench vise, anvil, various hammers, to remove material. He will also learn about associated tools such as bench vises, clamps,
6	Principles of SMAW	The student will learn about discontinuities and weld defects and also be able to physically perform weldments to AWS D1.1 standards in all four positions using 7018 electrodes.
7	SMAW Electrodes	The student will learn about categories, types of electrodes and their different applications
8	GMAW	The student will understand all aspects of GMAW equipment, the welding processes, and be able to apply that understanding to weld basic thin metal joints with the short-circuit GMAW process. This does not include structural GMAW or other metal transfer modes
9	Principle of Oxy-Fuel cutting and welding/Brazing	The student will understand OFW theory and apply this knowledge to safely set up, cut, and weld with an Oxy-fuel cutting and welding equipment. The student will also be able to braze various joints with OFW equipment.
10	Semester One exams	Midpoint exams

11	Principles of electricity	The student will understand the basic principles of electricity and electrical components. Practically, he will be able to perform basic soldering and diagnosing of electrical shorts and faults.
12	Blueprint reading	The student will be able to interpret all aspects of blueprints and be able to create practical projects from them. He will also be able to perform basic developments and sketches.
13	Welding symbols	The student will be able to understand and perform welds according to the welding symbols found on a blueprint
14	GTAW	The student will understand all aspects of GTAW equipment, the welding processes, and consumables and be able to apply that understanding to weld basic joints with the GTAW process. He will also have some limited exposure to advanced machine functions such wave control, foot pedal control, and pulse function.
15	Metallurgy	The student will have an introductory knowledge of material science as it relates to metal. He will be able to identify common metals for the purposes of determining weldability and process selection. He will also be able to understand hardening and annealing and be able to perform these functions practically
16	Cost Accounting	The student will have an introductory knowledge of accounting principles and be able to perform basic calculations for welding projects

17	DIT preparation and exams	The student will be given the opportunity to prepare for and undertake the DIT theory and practical exams
18	Exam preparation	The student will be given guided time to revise the coursework in preparation for the final exams
19	Final exams	Final exams at Kazo Technical School

Daily Schedule:

Except for public holidays, training will be daily Monday-Friday from 8:30 A.M. to 4:00 P.M. The school will provide lunch.

Attendance Policy:

A student should maintain as close to 100% attendance as possible. Each course requires the student to be present at least 85% of the total prescribed time in order to meet graduation requirements.

STUDENTS SHOULD BE AWARE THAT EMPLOYERS ARE MORE RELUCTANT TO HIRE GRADUATES WHO HAVE POOR ATTENDANCE RECORDS.

Lateness: Any student not physically present at the start of his/her scheduled class will be considered late. Excessive lateness will not be tolerated. After initial counselling, disciplinary action may be taken.

Absences: Any student who has a planned absence should inform the Principal beforehand. Any student whose absence interferes with his progress or causes them to fall below minimum graduation and/or grade requirements, may be dropped from the roll. A student who is absent 5 consecutive days may be subject to automatic termination.

Termination of a Student The administration reserves the right to terminate any student at any time because of poor performance, excessive absences, undesirable conduct, or failure to make payment of tuition, fees and/or any other charges. A student who is terminated will

be notified in writing by the school. Written notification will include the last date of recorded attendance. This is the date of official termination.

Upon termination, the student must immediately remove their personal items from the school. The school cannot assume responsibility for student property on or off premises at any time.

Re-admission under any circumstances will only be considered after a student submits such a request in writing to the school. Each case will be individually evaluated in a fair manner with the final decision determined by the School Director.

Cancellation prior to Starting Classes:

1. An applicant may cancel his enrollment at any time before the commencement of classes. -- If an applicant cancels the enrollment after receiving an acceptance letter only the tuition money will be refunded to the applicant but the registration fee will not be refunded to the applicant. The registration fee is 35,000 UGX.

Cancellation after Starting Class:

1. If a student wishes to withdraw from a program of study, he needs to notify the school principal either by a phone call or in person.
2. If the student is terminated by the school, the student will be notified in writing by the school. The written notification will include the last day of attendance which is the date of official termination.
3. Upon withdrawal/termination a refund calculation will be performed. This school uses a period of enrollment for all refund calculations. If a student has completed the first two weeks or more of the program, none of the tuition will be returned. If a student terminates before he reaches the two week mark, a refund calculation will be performed. This calculation takes the percentage of hours completed (which is calculated by taking the hours completed plus the hours missed) divided by the hours in the payment period (455 hours for the semester). This figure is the amount that the student will receive.

Grading and Evaluation:

All tests, quizzes, daily assignments, and final exams will be graded using this five point grading system:

A (Exceptional)

A- (Excellent)

B+(Exceptionally Good)

B (Very Good)

B- (Good)

C+ (Fairly Good)

C (Fair)

C- (Poor)

D+ (Poor-needs great improvement)

F (Failing)

Areas of Grading:

Work Ethics grade – this grade is based on attendance, punctuality, behaviour, preparedness, participation, productivity, professional appearance and effort.

Skills grade – this grade is based on the evaluation of the quality of the work performed based on American Welding Society standards. Final testing will occur at the end of the semester and each student must weld and submit pieceworks for testing. This test must be passed in order to receive a certificate.

Knowledge grade – this grade is based on tests, written assignments, and final exams.