

LECTURER: MARTHA DANSO
PROGRAMME: 4-YEAR B.ED (TECHNOLOGY EDUCATION)
COURSE: BLACKSMITHING AND BENCHFITTING
CODE: DTE 121
CREDITS: 2
SEMESTER: 2
LEVEL: 100

OBJECTIVES

The essential aim of this course is for students to have the ability to select appropriate basic tools and materials and know the working processes in Bench-fitting and Blacksmithing. They should also know the rationale behind the selection of these tools and materials. Again, they should be familiar with the processes in bench-fitting and blacksmithing. The course is also geared towards offering the student the opportunity to acquire the necessary skills in the safe use of hand tools, materials and processes. Students should also know how to care for, and maintain tools and machines used.

COVERAGE

WEEK	TOPIC	CONTENT / NOTES	ASSIGNMENT / DATE OF SUBMISSION
1,2	Saws and sawing.	Describing, sketching, labelling and noting functions of saws. Discussing types of saws, procedure of sawing and safety precautions to be observed.	Outline six systematic steps for sawing noting two safety measures to be taken.
3	Files and filing	Describing, sketching, labelling and noting functions of files. Discussing types of files, cross-sections and uses, techniques of filing and the defect in filing.	a. Sketch and label the hand file and describe its special characteristics and functions. How is it different from the flat file? b. Discuss the defect in filing stating how it could be reduced, prevented and corrected.
4	Drills and drilling of metals and plastics.	Describing the various types of drills with special emphasis on the twist drill. Differentiating between drilling of plastics and metals. Identifying course projects.	Neatly sketch the twist drill, label the most essential parts and describe the functions of each. Week 5 (submission)
5	Chisels and chiselling	Identifying the various types of chisels and chiselling various materials.	With the aid of a sketch show how to chop of a hole of diameter 20mm from a mild steel plate of thickness 2mm.
6	Rivets and riveting	Describing rivet heads, calculating rough rivets and riveting materials by single and multiple means.	Practice how to rivet two mild steel sheets together with a rough rivet. Inspection (week 7)
7	Metal finishes	Discussing some potential metallic finishes as a means of protecting metal surfaces.	Class quiz on content discussed up to week 5.
8, 9	Soft soldering:	Analysing materials for soldering (fluxes, solders), tools / equipment, fastening materials by soft soldered	Using the Tin-Lead diagram on a graph sheet, determine the approximate melting points of the following: fine,

		jointing. Explaining sweating soldering.	pewter, tinman and plumber's solders. Describe how to prepare 'killed spirit' in the lab observing safety measures and stating one reason why it is so called. State two real life applications of soft soldering joint. Week 9 (submission)
10	Black-smithing tools and equipment	Discussing the basic tools and equipment such as the hearth, tongs, anvil, sledge hammer and swage block.	Identify all basic blacksmithing tools in the blacksmithing workshop.
11	Principles and properties of black-smithing	Explaining the principles of re-crystallization and properties of hot-forgeable materials. Discussing the advantages and disadvantages of blacksmithing.	Class quiz on content from week 6 to 9
12	Black-smithing processes: bending, upsetting	Discussing the processes of bending an acute, obtuse angle and 'an eye'(ring). Describing upsetting noting the correct temperatures and the safety measures to be observed.	With the aid of neat sketches describe how to bend an eye of diameter 80 millimetres with a 10mm thickness of mild steel rod noting the correct temperature, tools and equipment to be used and all safety measures to be observed. Week 13 submission
13	Drawing down and fullering	Discussing and demonstrating the two processes, emphasising the defect in drawing down a taper.	Practice drawing down in the workshop.
14	Twisting, swaging and flattening.	Describing and demonstrating the three processes emphasising even twist in Twisting, smoothness in Swaging and flatness in Flattening.	Practice all three processes in the workshop.
15, 16	Project submission and end of semester examination	Revising notes and carrying on with project work in the workshop.	Submit project-work with folios.

METHODOLOGY

The course is taught through practical activities and not as abstract theoretical work since the ability to select and use tools for the correct purpose is best learnt through practical application during the making of the artefacts or projects.

MODE OF ASSESSMENT

The Continuous Assessment of 40% is accrued from all the assignments which include the quizzes, out-of lecture room assignments and practical project to be submitted. Failure to take part in these assignments and practical work renders a student ineligible to take the end of semester examination.

The End of semester examination carries 60% of the coursework.

REFERENCES

Love, G. (1980). *The Theory & Practice of Metalwork*, London & Edinburgh, Longman.

Sackey, J.K.N. & Amoakohene, S.K. (1996). *The Motivate Series – Metalwork Technology*, London & Basingstoke, Macmillan.

Timings, R.L. (1991). *Mechanical Engineering Craft Theory & Related Subjects: Vol 1&2*, Singapore, Longman-Singapore.

Willacy, M.D. (1989). *Craft & Design in Metalwork*, London, Hutchinson.