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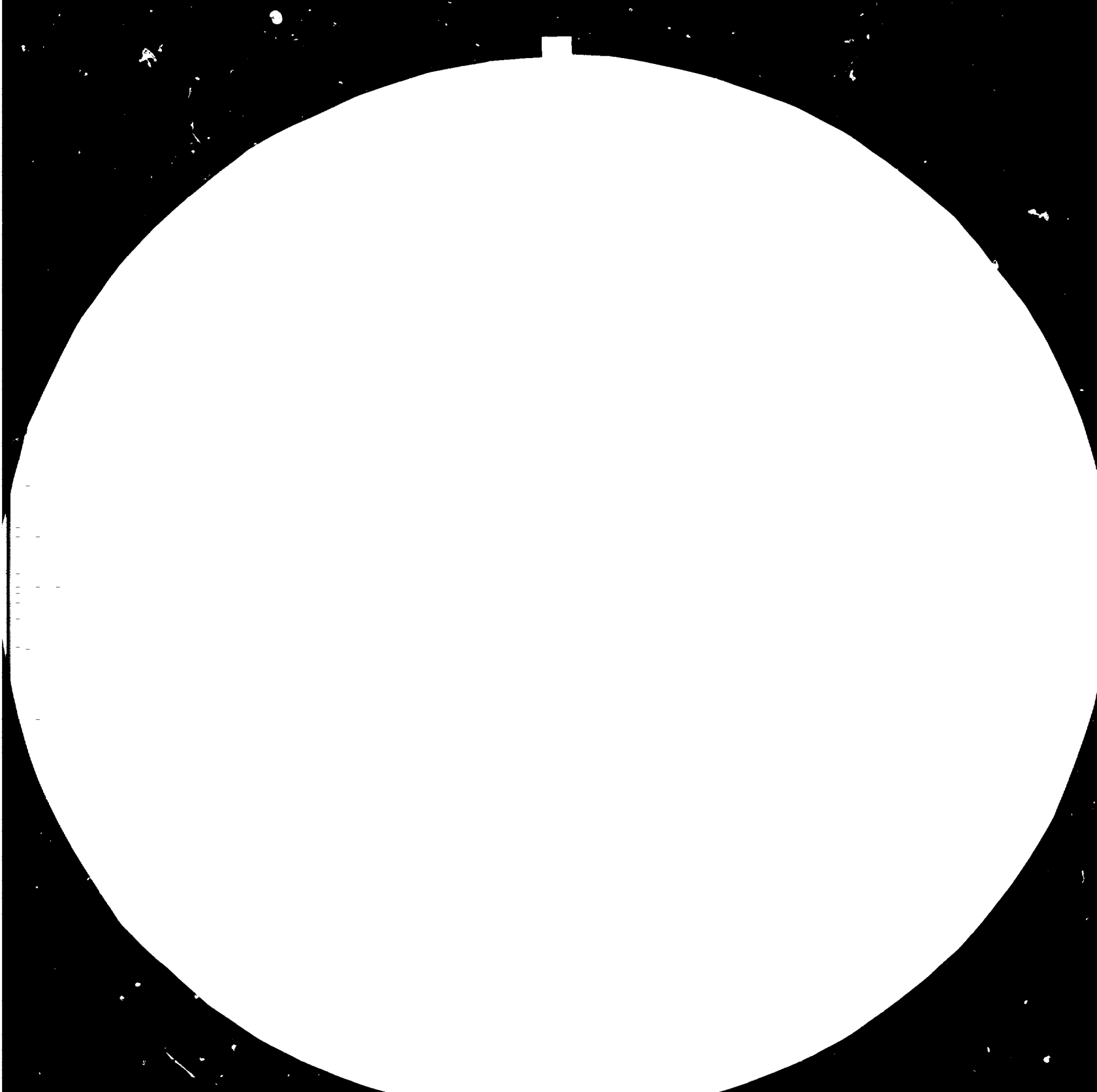

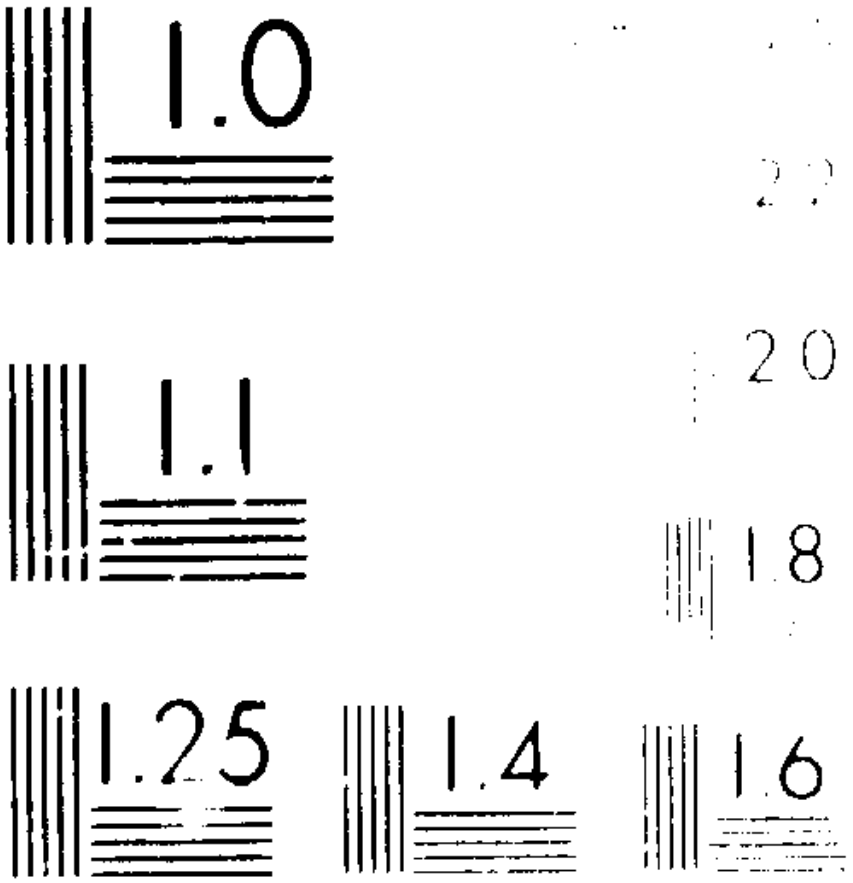
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1st February, 1983
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Tanzania

TRAINING FOR THE LEATHER PRODUCTS INDUSTRY IN UNITED REPUBLIC OF TANZANIA

DP/URT/78/010/11-53/31.7.D

Terminal report

Prepared for the Government of the Republic of Tanzania
by the United Nations Industrial Development Organisation,
executing agency for the United Nations Development Programme

Based on the work of R.W. Beeby
Footwear and Leather Products Technologist
Advisor on Leather Products Training

United Nations Industrial Development Organisation
Vienna

TABLE OF CONTENTS

I. ACKNOWLEDGEMENTS

The expert wishes to thanks the undermentioned for advise, help and assistance in completing this assignment, and also to pay tribute to many other unnamed individuals who were generous with time and information.

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18.	Dr. F. Perri	General Manager Morogoro Shoe Company.
19.	Mr. Azim	Bora Shoe Company.

II. SUMMARY

The programme of work set out in the job description has been carried out as follows:

1. Study of the basic education system of Tanzania.
2. Observation of existing manufacturing techniques and performances in footwear and leather product making.
3. Analysis and evaluation of data from 2 above.
4. Preparation of an array of syllabi likely to satisfy the immediate training needs of the country.
5. Determination of the ratio of theoretical to practical work and certificates to be awarded.
6. Preparation of organisational chart showingthe staffing needs of TILT.
7. Preparation of text book, manual and periodical list which links numerically with each syllabus.
8. Advise on training aids, didactive methods and the organisation of an information centre in TILT.
9. Analysis of the availability and quality problems and submission of a recommended research and development programme.
10. Preparation of a report which though brief, is factual and worthy of more than casual perusal.

III. INTRODUCTION

Although the project service number would indicate 1978 as the commencing date, the project document was signed in October, 1979. Since that time, study of the files show massive inputs of money and machinery, while the accumulated reports of UNIDO Advisors and Consultants bear witness to the amount of work done.

Despite these considerable inputs, the productivity figures at the major production units leave very much to be desired, but what is worse is the complete lack of concern at this deplorable state of affairs and failure to comprehend that money invested must be justified by progressive increases in productivity.

It is obvious from the paucity of individual job training manuals that the need of the Tanzanian Institute of Leather Technology will be greatest at operative and lower management levels, though in the fullness of time a Diploma programme could be possible if there were enough applicants.

In an economic situation which is worsening by the week, it is paramount that product cost is reduced to a minimum; a difficult task when the cost of Tanzanian leather is 2½ times the world price in most categories. The answer to the problem is product simplification, minimal use of imported materials, better material and production planning and productivity figures several times higher than those now being accepted.

The submitted syllabi will need to be analysed and produced in timetabled teaching plans, so it is hoped that resources will still be available in the budget to appoint expatriot specialists to assist in starting up the first courses, handing over to their "opposite numbers" in about two years or so.

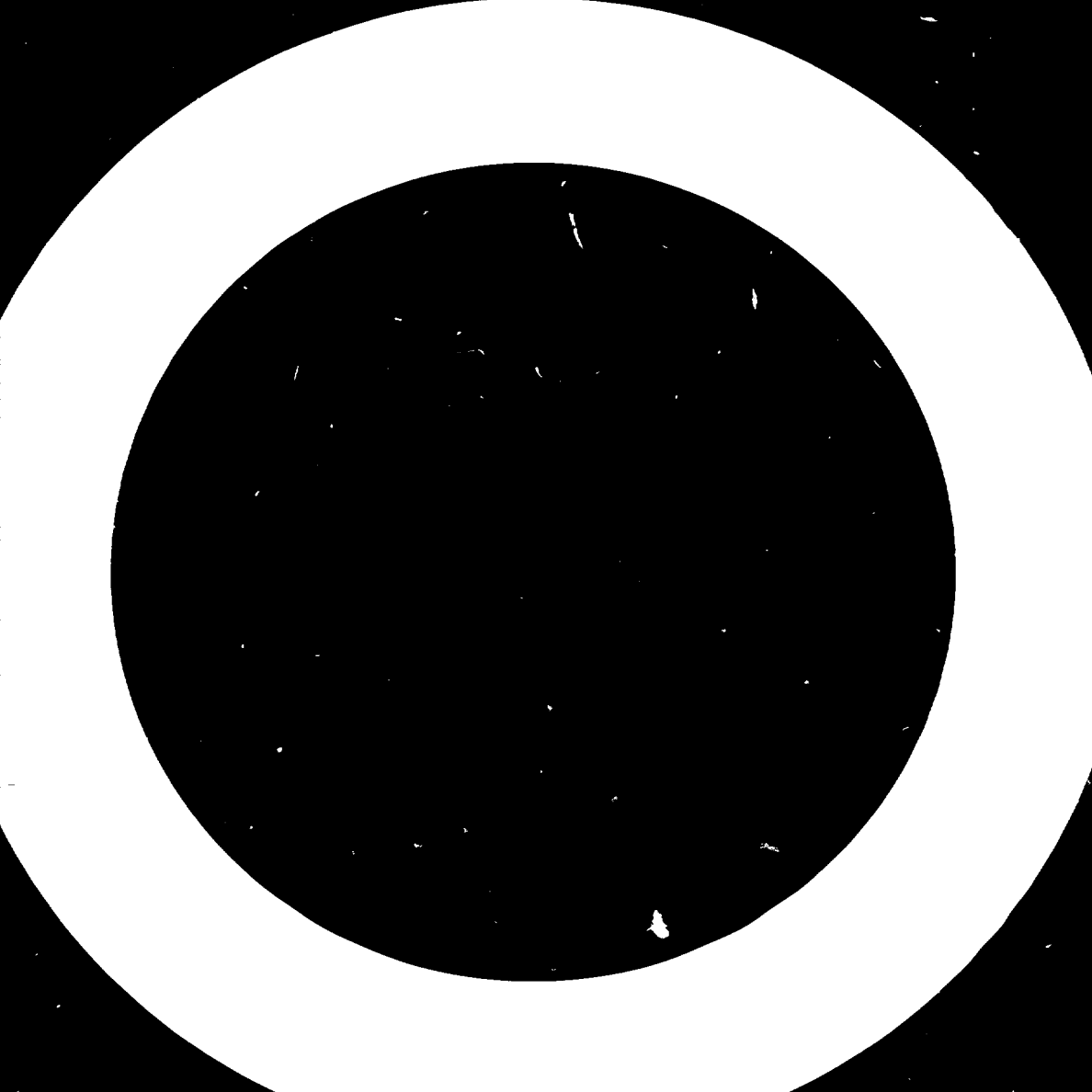
Careful study of the educational system indicates the existence of three main tiers controlled by the Ministry of National Education as follows:

1. Primary Education - Standard 1 - 7 inclusive
2. Secondary Education (1) Forms 1 - 4
3. Secondary Education (2) Forms 5 - 6 University extrance level.

the two secondary courses being at English 'O' and 'A' level standards approximately.

Most of the courses submitted for the footwear and leather product industries cater for participants of minimum standard 7 level as it is unrealistic to be expect routine machine operatives to be recruited potential from university and polytechnic candidates; when this happens the length of stay in the industry is short & wasteful. A better course is to recruit for manual dexterity and upon acceptance introduce other elements of further education on a module basis periodically, to maintain interest and to make fit for promotion to supervisory grade when the opportunity occurs.

Course syllabi have been written for those areas where the immediate need is greatest though decisions will need to be taken about the first courses to be mounted.



ANNEXE 2. Design and Pattern Cutting for Footwear: a. b. Leathergoods.
12 weeks: Pubs. 2.5.6.7.8.10.11.23.24.26.
27.29.32.34.35.38.39.42.43.44.

ANNEXE 3. Leather Cutting Course:
12 weeks: Pubs. 8.9.10.13.19.26.27.29.31.
32.34.36.38.39.41.42.43.44.

ANNEXE 4. Preparation and Stitching Course.
Footwear and Leather Products:
4 weeks: Pubs. 1.2.5.10.11.12.14.16.20.21.
22.23.24.27.29.34.36.38.39.40.42.43.

ANNEXE 5. Analytical Training Course for Mechanists and Preparation Operatives:
4 weeks: Pubs. 45 + G.M.C. exercises

ANNEXE 6. Shoemaking Course:
12 weeks: Pubs. 8.9.26.27.28.36.38.39.42.43.

ANNEXE 7. Village Shoemaker Craft Course:
4 weeks: Pubs. 2.5.7.10.23.24.27.34.38.39.42.43.

ANNEXE 8. Orientation Course in Footwear and Leather Products:
12 weeks: Pubs. All except 44 with lesson plans.

ANNEXE 9. Basic Operatives Certificate Course:
4 weeks: Pubs. Institute training manuals.

ANNEXE 10. Higher Operatives Certificate Course:
8 weeks: Pubs. Institute training manuals.

ANNEXE 11. Materials Testing for the Leather Products Industries:
8 weeks: Pubs. 44 + DIN and BSI specifications.

ANNEXE 12. Production Management:
4 weeks: Pubs. I.L.O. manual 26.

ANNEXE 13. Process and Quality Control in the Leather Product Industries:
4 weeks: Pubs. [illegible]7.

ANNEXE 14. Departmental and General Management for foremen:
2 weeks: Pubs. 26.

ANNEXE 15. General Management for Supervisors & Inspectors:
2 weeks: Pubs. 26.

ANNEXE 16. Course for Sewing Machine Mechanics:
3 weeks: Pubs. Singer - Pfaff - Adler & Necchi manuals.

V. RESEARCH AND DEVELOPMENT

It is recommended that the research and development programme be planned and budgetted over several years to ensure that funding will be available when required, and will sustain development projects to a successful conclusion, otherwise it is a complete waste of time and money to start.. at all.

The programme might be structured as follows:-

Short term projects ... ... less than six months
Medium term projects ... less than two years
Long term projects ... ... in excess of two years.

All project work should be carefully considered by a special sub-committee of the Control Board of the Institute and official approval given to acceptable projects. Ad hoc un-official projects have a tendency to waste funds and usually only benefit the researcher personally, so it is recommended that such work as cannot be approved through lack of funds, lack of facilities or other reason should be submitted to industry for financing with a firm agreement that subscribers would have prior claim to positive results, and advantageous licencing would be granted.

A. SHORT TERM PROGRAMME

1. Analysis of work content and material value and source in existing commercial product ranges.

2. Redesign programmes rationalizing ranges to suit the soft, protected market in Tanzania, with minimal labour and material content.

3. For ranging investigation into import substitution eg.

   (a) Latex and its derivatives for use as adhesives and compound bonding agent.

   (b) Development of vegetable tanned leathers using Tanzanian extracts, specifically for the hand tooled, carved and machine embossed market.

   (c) Development of designs and cut blanks for export and home use.

   (d) Development of metal castings and pressings in conjunction with another Institute for incorporation into leather products.

   (e) Barrelling and plating techniques.

   (f) Utilisation of bone and horn as accessory material eg. Capstan lathe turned and pantograph engraved for the mass market and hand carved for super quality ranges.

B. MEDIUM TERM PROGRAMME

1. Absorption of low quality or light weight soles by lamination in shoe bottoming techniques.

2. Development of product ranges using vegetable tanned leather strips for plaited sandal uppers, incorporated into vegetable tanned leather insoles, soles and heel lifts.

3. Develop simple metal and hardwood jigs tools, formers and other devices for making footwear and leather products without power.

4. Study alternative flow process charts, both for actual and imaginary products with a view to eliminating bottlenecks and increasing productivity.

5. Study work payment systems and recommend incentive bonus payment methods for progressively increasing productivity at plant level.

C. LONG TERM PROGRAMME

1. Investigation into average qualities of leathers produced, and introduction of a lower quality absorption programme as follows:-

   (a) Stripping, weaving & plaiting techniques used internationally in shoemaking and leather goods.

(b) Development of small wooden hand weaving looms for leather strip weaving.

(c) Development of soft board size and shape matrices for individual shoe upper and leather product weaving. (Cushion lacemaking technique).

(d) Development of techniques to produce inexpensive slotted bases for interlacing and thonging as a further means of surface damage obliteration.

2. Leather and Canvas Coordination Programme
as the Canvas Factory comes "on stream", in which small leather components are blended with large whole cut canvas ones to maximise leather utilisation, and lower product cost.

3. An Array of International Produced Leather Products
should be progressively built up for:
(a) Cost and value analyses,
(b) to determine their degree of competetiveness,
(c) to investigate the work content and techniques used.
(d) to start a progressive product "intelligence" service which could be linked with the TILT Institute information service to produce fee earning bulletins and reports.

VI. ORGANISATION AND STAFFING

It is recommended that the Tanzanian Institute of Leather Technology have a Board of Control made up of industrialists, education administrators, leather & leather product technologists and representatives from finance and banking.

The Director would be responsible to this policy forming body for executive action and accountable for funds allocated as budgets for different work programmes.

Accountable to the Director would be:

1. The Information Division which would incorporate the library, information retrieval and dissemination.

2. The Training - Research and Development Division
which splits naturally into two parts.
   (a) Leather technology and manufacture.
   (b) Footwear & Leather Product manufacture with Quality Standards and Testing and Maintenance serving equally each subsection of the division.

3. The Administration Division which it is suggested could be responsible for all services including purchasing, stores, accounting and running the hostel.

An organisation chart has been prepared as a discussion document for the control board who will no doubt wish to amend, in the light of the budget at their disposal. (Annexe 19).

It is further recommended that a team of expatriots; experts in teaching leather and leather product technology and management, be appointed with counterparts for up to three years when the Institute commences, to ensure the establishment of high quality instructional inputs.

VII. ADDITIONAL ITEMS OF HAND TOOLS, EQUIPMENT AND ACCESSORIES

Although the machinery and equipment list for the footwear courses appears adequate when augemented from the Morogoro Factory, there are many small items which would improve the scope in the making of leather goods if they were available.

Annexe 20 enumerates the suggested items which includes non-leather materials and accessories. Many items could be produced within the country and where this is possible it is suggested that work begins as soon as a budget could made available to save delay when the Institute is ready to start recruiting.

VIII. TEACHING METHODS

1. Information and Libraries

Text books, manuals, periodicals, bulletins from institutes and manufacturers, information sheets and specialist fashion journals are all composed of the printed word augmented by diagrams and photographs, which together with film, audio and video tapes provide the bulk of available information.

2. Educational Technology

Specialised text books, which should be available at institutes of education, will show the latest methods and techniques of providing information via linear, branching, methetic and algorithmic programs, especially the last named which is a proven technique in fault finding and diagnosis. The armed forces of the UK and the USA use the methetic method extensively to teach a great number of complicated techniques and procedures with remarkable clarity far away from the source of material. The term "distance learning" now describes this type of work program, and it was with this in mind that the post of program writer was suggested for the information division of the Institute.

3. Lectures and Demonstrations

For many subjects where practical training is involved, short introductory lecture/demonstrations in which handouts and aide-memories are supplied prior to the practical tuition is normal practise.

Double sided machine set-up, control and operating information boards, chained to the machine and protected by transparant plastic envelopes would provide information at the operating point - a very valuable aid in mixed skill groups where one instructor is controlling the whole process.

A variant is an audio program for each machine with telephonists' head set to aid concentration.

4. Black-boards, overhead projectors and flannel

Boards allow large groups to participate in seminars by enlargement of the information.

5. Audio and Video tapes are excellent teaching media, but preparation time is always the restricting factor:

   (a) One hour of audio takes at least 10 hours to prepare
   (b) One hour on video takes at least 100 hours to prepare.

6. Simulators are useful where only one machine is available for many students. They are not expensive to build, but need many man/hours to design and build the first proto_type.

   Another more easily reproduced type is the stitching exercise sheet in bonded fibre and the cutting exercise in cartridge paper, both allow for a quality and speed assessment against known standards.

7. Competitive team production can only to introduced if the skills have been taught to acceptable standards on a single design. The resulting increase in productivity is well worth the extra planning involved.

8. Preparation and homework is useful in establishing that:

   (a) The subject is understood
   (b) The student is personally accountable.

IX. CONCLUSIONS AND RECOMMENDATIONS

Through observation and questioning it was obvious that productivity was very low in shoemaking but less so in leather goods production where this was seen.

1. There appears to be a blissful disregard of the relationship between productivity and product cost.

2. The lack of any incentive scheme makes the task of raising productivity that much greater.

3. Production plans do not appear as though they are being adhered to.

4. Operator waiting time was worse than any this expert has ever seen anywhere in the world.

5. Material availability appeared to be unpredictable, even so, work was put into plan with resultant stoppage of production, with full wage payment.

6. Capital investment control, fixed and variable overheads control, non-productive labour control and other management control tools seem not be working.

7. Material costs are more than twice the world price.

8. The retail price of shoes and handbags is unrealistically high in relation to average earnings, and will not be exportable as profit makers.

A. RECOMMENDATIONS

1. Put a crash programme of training of operatives and lower management staff into operation at the earliest date.

2. When training has been given, ensure that each post has a clear job description and its holder is made accountable for his/her performance.

3. Demote management personnel who fail to manage.

4. Define quality standards clearly and ensure they are maintained without equivocation.

5. Do not plan any production unless the materials equipment and labour is to hand in its entirety for the whole production batch.

6. Ensure production plans are balanced in all departments theoretically and then see they are carried out precisely to target each day.

7. Make certain that graduates and other beneficiaries of higher education employed in the industry are more than receptacles of received knowledge; they should all be capable of taking innovative executive action in any crisis, and have had extensive practical experience.

8. Insist that the first item in the job description of training officers is the preparation and publication of operative and process training manuals, and reduce the length of induction courses to no more than five days.

9. The ultimate aims of producing a greater volume of products, of acceptable quality at lower cost hinges on improved productivity and better employment of labour and materials. The economy generally will benefit from this larger volume at lower cost by reduction in retail prices. The quickest route to this desirable state of affairs is by-intensive training, range reduction and product simplification; an attempt has been made to reflect this in the syllabi.

UNITED NATIONS

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO 19 March 1982

PROJECT IN THE UNITED REPUBLIC OF TANZANIA

JOB DESCRIPTION

DP/URT/78/010/11-53/31.7.D

Post title	Consultant in the Leather Products Industry/ Training Expert
Duration	Three months
Date required	July 1982
Duty station	Dar es Salaam and Mwanza, with possibility of travel within the country.
Purpose of project	To work out syllabi and an initial R+D programme for the Tanzania Institute of Leather Technology (TILT) in the field of training, quality control and applied research in leather products (mainly footwear and leather goods), according to the needs of the respective subsector in the country.
Duties	The consultant will be attached to the Tanzania Leather Associated Industries (TLAI) Corporation and, under the guidance of the Chief Technical Adviser and in close co-operation with the other team members, will specifically be expected to:

1. Analyse and evaluate the training needs of the national leather products industry, with special reference to the local conditions, existing manufacturing techniques and the basic education system of the country;

2. Work out detailed syllabi for the training activities to be given by TILT in Mwanza, specifying the training levels, the content, and the ratio of theoretical and practical training, as well as the certificate system to be introduced;

3. Prepare proposals for technical literature, training aids and didactive methods to be used in the institute and give advice on staff requirements;

4. Give advice on the organisation of an information unit in TILT, recommend technical information, books, journals, etc., to be obtained and later systematically collected;

5. Analyse the needs of the leather products industry for R+D programmes and recommend a suitable initial technical development programme to be carried out by TILT, paying special attention to the availability of raw materials, and the quality problems of the local leather products.

The expert will also be expected to prepare a final report, setting out the findings of the mission and recommendations to the Government on further action which might be taken.

Qualifications — Extensive experience in the manufacturing technologies and design of leather products (footwear and leather goods); knowledge of modern professional training methods and current trends in R+D for leather products industries.

Language — English

Background Information — The country's livestock could provide the raw material required for the development of the leather and leather products industries. TLAI controls three tanneries of a total capacity of 26.4 million sq.ft. per year, two shoe factories of a capacity of 11 million pairs of leather and canvas shoes, and beach sandals. A new leather goods plant started operation in Morogoro at the end of 1981. Apart from these factories, a considerable number of small manufacturing units are producing various leather and leather products and new units are to be installed throughout the country.

The capacity utilisation and the quality of products manufactured are both rather low. A large-scale project was started in 1979 in order to assist the TLAI to increase productivity, improve technology and marketing, and organise appropriate maintenance services in the Bora Shoe Factory.

One of the major drawbacks of the leather subsector in the country is theshortage of qualified technical personnel at all levels. Realising the need to train key-workers, supervisors, technologists, designers, maintenance technicians, quality controllers etc., the Government decided to establish the TILT which will have training facilities (including a tannery and a leather products pilot plant), two quality control R+D laboratories, lodging and servicing facilities and will be located next to the existing tannery in Mwanza. Construction work will be finished by the end of 1982. The equipment for the pilot plants and the laboratories will be supplied from a UNIDO project and will be installed at the same time.

The TILT will render training, quality control and technical development services to the entire footwear and leather goods industry in the country. Later, it will also be expected to train specialists from the neighbouring countries. The institute will start its operation at the beginning of 1983 and will gradually provide training and tetraining of specialists for the footwear and leather products manufacturing units. The syllabi and the initial R+D programme are required for starting up TILT's operations.

Annexe 2a.

TITLE: DESIGN AND PATTERN CUTTING FOR FOOTWEAR

DURATION: 12 WEEKS

Objective: The aim of this syllabus is to prepare candidates for a career as professional designer pattern - cutters capable of product development from design concept to finished cost - estimated sample ranges of footwear.

In addition to sources of design information, participants will be exposed to manufacturing needs in different departments, and have a sound appraisal of the role of the designer/pattern-cutter in raising productivity and reducing costs.

Curriculum:

1. Sources of new design: Fashion influences and the value of international styling.

2. Sources and types of material in current use for upper outsides and linings, insoles, soles, and other components.

3. The growth of feet from infancy to maturity and differences between feet and lasts for different types of shoes. Types of lasts. Comparison between sizing systems and size increments.

4. Forme cutting methods and their affect on the final pattern. Comparison of methods.

5. Standard Patterns and sectioning into components for different classic styles. Markers and matrices. Machinist "Xray" information sheets for upper production.

6. Positive & negative springing to enhance fitting properties.

7. Principles and methods of grading. Restriction, group grading into 2, 3, 4 die systems. Multi fitting ranges. Sole and insole pattern cutting.

8. Evaluation of tooling costs for pattern & knife production: and appreciation of the factors which influence decisions on hand & press cutting.

9. The role of the pattern cutter in material economy programmes. Methods of reducing quantities of material used. Pattern scaling methods. Procedures for estimation of the cost of upper components. Costs of component and assembly costs. Profit margins & selling prices.

10. Specification writing for trials, samples and bulk production.

11. The theory and practise of range - building. Sample display methods and organisation of the sample room linked with outside sales staff organisation.

The practical nature of this course makes it necessary that the lecture and demonstration work is not more than 20% of the total time with adequate supplies of pre-print material to reinforce new concepts being presented.

In keeping with other technical training establishments a normal 7 hour day is envisaged, in which the two ¾ hour periods are allocated for theoretical work leaving 5½ hours practical work. Evening preparation should also be considered due to the heavy concentration of work in most parts of the course.

Annexe 2b.

Title: DESIGN AND PATTERN CUTTING COURSE FOR LEATHER PRODUCTS

Duration: 12 Weeks

Objectives: The aim of this course is to produce professional designer/pattern cutters capable of developing product ranges in different areas of the leather goods & Leather Product Industry.

To introduce sources of information concerning fashion trends, colours and other factors influencing accessory design.

To introduce elements of design & modern trends in the production of leather sports-goods and baggage.

To explore current trends and value analysis in soft & hard (reinforced) leather goods.

To emplasise the need for accurate costing and cost control to remain competetive.

Curriculum:

1. Sources of new design. Fashion influences. International styling.

2. Sources and types of material. Leather simulated materials, canvas, fabrics and non woven products used in leather goods.

3. Making proto-type mock-ups in paper & card, and production of trial patterns from "toiles".

4. Production of card master patterns annotated with all relevant information concerning edges, seams, backers, linings, & methods of assembly.

5. Sectioning master pattern to produce sub-patterns for components, backers, strainer boards, sugar paper shape retainers, plumpers and other reinforcements.

6. The use of string - card, woven & non-woven strips for strap & handle reinforcement techniques.

7. The use of metal pressings for locks, catches, studs, hinged frames, plaques and miscellaneous small-wares.

8. Comparison between fitted jewellery cases, attache cases and other fitted "hard" products, and machine stitched "soft" products for their market/fashion.

9. Instruction and demonstration module on small leather goods, wallets, purses, label and licence cases, credit card carriers etc. Raw edge and folding techniques, use of the sleeking bone.

10. Instruction and demonstration modules on sports goods containers, carriers and leather-wear protectors.

11. Use of leather as protective material in vulnerable locations on canvas products. Seam protectors, corner reinforcers, heavy wear strips and hard wearing bases.

12. Incorporation of wheel and ball rollers in baggage products.

13. Methods of decoration and relative costs.

14. Range building, pricing, display and marketing methods.

Due to the need for much practical work on this course it is suggested that lectures and demonstrations be restricted to no more than 20% of the total time, and are heavily backed by preprints in different subject areas.

The normal working day should allow 2 periods of ¾ hour lecture/demonstration, each of which should be followed by 2¾ hours of practical work.

Annexe 3

Title: LEATHER CUTTING COURSE

Duration: 12 weeks

Objectives: To give participants a sound knowledge of types of leather and tannages with their average values.

To produce cutters who understand that a high waste factor lowers profits.

To produce cutters of proven ability in exercises where spatial relationships are involved. To instruct practically in methods of getting optimum cutting results on a regular basis. To eliminate at an early stage participants who do not possess the natural skills required by a professional leather cutter.

To teach methods of estimating a leather's "cutting factor" as a percentage

Curriculum: Introduction to leather as a material. Microscopic cross sectional diagrams - (duplicated handouts). Types and varieties of skins available. Methods of temporary preservation. Common defects found in hides and skins. Sequence of operations involved in the different methods of tanning hides and skins in common use in Tanzania (followed by a tannery visit). Preparation and mounting of swatch specimens in note books. Different methods of finishing in common use.

Relative values of hides and skins linked with the end leather product value. Discussion on added value estimated in converting to leather products. Relationship between skin size and pattern size to pattern-lock and its effects upon product cost.

The importance of lines of tightness, areas of relative quality and substance in the determination of the value of cut components Techniques used in absorbing skin defects and lower qualities without lowering product quality.

The relative simplicity of acquiring skill to perform the physical act of hand cutting using analytical methods. The complex nature of the decision process before pattern and/or knife placement prior to cutting, involving lines of tightness, areas of quality and substance, degree of stretch, surface texture, colour match, pattern lock and mental forward placement plan. Awareness of a good natural sense of spatial relationships. Matrix board tests.

Multi-layer cutting of fabrics. Lay wrapping techniques. Machines used for cutting and material feeding. Cutting sheet materials. Methods of checking incoming leather against sample and determination of relative cutting value. Types of hand knives and blades. Shaping and sharpening clicking knives. Sharpening stones and buff straps - how to make. Types of cutting surface available - care and maintenance procedures. Planes, scrapes, awls, fabric staplers, surface weights and their uses. Types of press and press knives in general use.

Fabric layouts - warp cut - weft cut and bias cut. Cutting exercises and scrap cutting using mini-patterns. Layouts on simulated cattle hide sides to produce complete component sets. Layouts on simulated Kid and Goat skins to produce complete sets. Layouts on simulated Sheep skins to produce complete sets. Layouts on simulated other skins to produce complete sets.

Emphasis of basics of good cutting

Accuracy to pattern
Vertical clean cutting
Accurate prick hole location
Accurate count of components
Neat stacking and tying.
Correct crayon marking (reverse)

Marking up individual cutting patterns with areas of relative minimum quality, substance, stretch and tightness. Colour variations andmethods of components matching. Texture matching. Legitimate locations for healed scars and skin defects in the component. Leather scrap salvage into small components. Cutting skins after approved layout into production linings. Marking up selected skins on reverse with silberweiss pen. Introduction to and practise with pattern area assessment methods. Target feetage estimation per 100 products in one leather. Estimation of the percentage cutting value - different leather bundles. Repeat for other tannages and suppliers. Two-quality cutting using 'runner' patterns. Caster and rounder cutting.

Press use and maintenance. Care of knives and cutting pads. Forged versus cold bend knives for different purposes. Use of the press as a decorative die punch machine. Further exercises in pattern scaling and determination of 1st and 2nd waste. Adjustment for size rolls above/below average.

Further practice in target feetage assessment and comparison with actual per 100 batch. (In co-operation with factories.) Calculation of profit or loss in feetage and value per 100 batch. Preparation of a cutter 'League Chart' showing all issues and cutting results over one month in all leathers. Show total gain or loss each leather, for each cutter (in co-operation with factories).

Rank cutters in descending order according to their profitability. Draw red 'break-even' line under last profitable cutter. Outline retraining programme for loss makers, if repeated a second month. Introduction of different bonus payment systems. Issue production line work provided by sponsoring factory for side leathers, sheep, kid and goat, suede split and other leathers under the supervision of the leather cutting instructor who must be consulted by students concerning each doubtful decision, or all leathers pre-marked in silberrises ink and approved by the instructor before cutting begins.

Daily cutting practise for a minimum of 5½ hours daily with two lecture/discussion sessions of ½ each is indicated; so production units should see that adequate materials, patterns and knives are to hand for optimum results.

Annexe 4.

Title: PREPARATION AND STITCHING COURSE FOR FOOTWEAR AND LEATHER PRODUCT, MACHINE ROOM PERSONNEL

Duration: 4 Weeks

Objectives: This programme is designed for personnel whose career is in the closing department (fitting and stitching department).

The aim is to give a theoretical and practical training in the use of preparation, stitching and finishing off machines with sequences of operations for differing types of work.

Machine maintenance and alternative uses.

A further aim is to give an appreciation of work loading, and its place in the overall production plan, with a review of labour and material costs throughout the department.

Cost estimation for developing products will be an important practical element in the programme.

Curriculum:

1. General principles of departmental layout with different types of work feeding and storage.

2. Detailed examination of working limits of disc and cylinder skiving machines, band knife splitting machines, and other edge profile shaping equipment.

3. Different types of edge treatments.

4. Methods of folding, pleating, seaming and joining components with appropriate pattern allowances.

5. Linear and die perforation, embossing, HF welding, flow moulding (HF) crunch - punching and other decorative techniques for edges or component interiors.

6. Review of flat, post, cylinder arm and other sewing machines, single or multi needle, swing or straight stitch, with examples of their most cost effective use.

7. Use of hand fitting to improve quality and performance

8. Incorporation of rivets, eyelets, plaques, buckles and other metallics for decoration or function.

9. Use of automatics and automation in volume production

10. Effects of adherence to work scheduling upon product cost and client satisfaction.

Annexe 5

Title: ANALYTICAL TRAINING FOR MACHINISTS AND PREPARATION OPERATIVES

Duration: 4 Weeks

Objectives:

To train machinists and preparation equipment operatives to adequate levels of performance in quantity and quality of work done.

To progressively check performance during training and record results.

To introduce 'set-up' and 'operate' procedures for different categories of work using.

(a) The basic machine
(b) The machine plus accessories.

To emphasise the need for analytical routines to ensure that standardised production results, of an adequate quality.

Curriculum:

Introduction to source of power and machine control systems.

Exercise programme for setting up prior to working; with correct accessories, findings and sub-tools.

Checking machine is properly balanced, timed and adjusted.

Installation of method studied simulation programme for stitching - skiving - splitting - folding and perporating.

(a) Using simple exercises with time & quality targets
(b) Using progressively more difficult exercises
(c) Assembling bonded fibre or other components
(d) Alternatively skiving & splitting, folding and perforating leather scrap components to required standard.

Introduction of production line components for simple operation - with recorded result.

Introduction of progressively more advanced work with recorded results.

Daily preparation of performance graphs with quality achievement through course.

Final test on production work.

Participants: Should be recruited from the stitching/fitting departments or if recruited direct from school should have had a series of normal dexterity tests, Ishihara colour assessment and any other relevant test of good eyesight.

Equipment: It is often found better that the participant is allocated a properly overhauled machine on which to train with subsequent incorporation into the production line upon completion of training (maintenance state is thus improved).

Other items: For all stitching operations the use of bonded fibre without thread is advised in a set of progressive exercises (S.T.I. G.M.C. or similar cheaper exercises). Miniature components cut from scrap by trainee cutters has to be used for preparation operations.

Annexe 6

Title: SHOE MAKING COURSE

Duration: 12 weeks

Objectives: To provide appreciation studies in Pattern-cutting, clicking (leather cutting) and Upper machining in addition to the main shoe making syllabus.

To introduce a survey of the major methods of shoe making and where practicable introduce manual skill training for each.

To introduce sequences of operation, machine set-up procedures, operating norms and comparative costs for each major method.

To provide video - audio and printed text manuals of instruction for distance learning.

Curriculum:

1. The History or shoe making a brief survey of early footwear making and development.

2. Introduction to basic contructions.
   (a) Cement lasted - cement sole attached.
   (b) Tack and staple lasting with cement soles.
   (c) Goodyear welted - traditional and variants.
   (d) Veldtschoens and stitchdowns.
   (e) Moccasins, Zag-mocs and variants.
   (f) Slip-lasted, force - lasted with other Californian variants.
   (g) Moulded in-situ bottoms - Vulcanised rubber and injected TPR, PVC, PU etc.
   (h) String lasting and stitch lasting techniques.
   (i) Turn shoes and slippers.

3. Types of lasts and international sizeing systems.

4. Toepuffs, stiffeners and other assembly components.
5. Correct sequence and balance of "pulls" used in hand-lasting methods.
6. Comparisons between hand lasting, pulling over, and toepull lasting.
7. Backpart moulding and seat lasting.
8. Waist and side lasting.
9. Pounding, scouring and roughing; machines used and techniques adopted.
10. Cements and cementing techniques.
11. Sole and insole cutting and preparation.
12. Sole moulding, activation, spotting and pressing.
13. Inside and outside heel attaching.
14. Finishing and prefinishing techniques and sequences.
15. Heel paring, scouring and superfining.
16. Edge trimming and pretrimming.
17. Inking, preinking, edge setting and heel padding.
18. Types of bottom finish, methods of application and polishing.
19. Bottom scouring, waist tattling, and bottom padding.
20. Mopping and finishing off.
21. Lining cleaning, cementing and socking.
22. Basic types and variations of cleaners and dressings.
23. Use of heat. Hot blasting and wrinkle chasing by ironing.
24. Comparative methods of dressing for different price levels.

25. Faking and retouching - hand and artist air brush.

26. Quarter pressing and forming.

27. Labelling, tissueing and boxing.

28. Introduction to costing - departmental labour costs, material cost, fixed and variable overhead expenses. Cost estimate sheets and compilation for different classes of production.

Annexe 7

Title: VILLAGE SHOE MAKER - CRAFT COURSE

Duration: 4 weeks (Morning or afternoon sessions)

Objectives:

To link leather product development at craft level to TILT (Tanzania Institute of Leather Technology).

To promote investigation and research into hand made products for marketing at high prices.

To introduce new materials and techniques from international sources to supplement or enhance traditional methods.

To provide highly skilled craftsmen/instructors for itinerant instruction modules for presentation in sequence regionally.

To plan modules to constitute a course.

To provide mobile classroom/workshops for setting up at designated regional centres using a "travelling circus" itinerary.

To develop R and D programmes using local know-how and materials linked with latest imported ideas.

Curriculum: Demonstrations. lectures and practical work in:

1. Handsewn welted and turnshoes
2. Handstitched, hand finished soles. Built heels.
3. Channelling and sewing with bristle - filament saddlers awl and needle. Stitching and sewing awl types and sources of supply.
4. Trimming with cutters and abr. sive wheels. Hand shaping scrapes for heels and edges.
5. Bottom scraping - buffing and finishing.

6. Mocassin, Zag-moc and Tube Shoe Productions.

7. Californians - Sliplasted, force-lasted and variants.

8. Sandal design and making. Categories available in world markets.

9. Decoration techniques Stitching, perforation embossing, carving, plaiting, weaving, tinting, polishing. Metal embellishment.

10. Development of equipment from local hard woods to stream-line hand processes and start "division of labour" programmes with work teams.

11. Simple Administration and Accounting to control materials & labour content in products, Normal profit margins and mark-up. Single entry book-keeping and other control systems.

Lecture/Demonstration work 20%
Practical work and guided research 80%

Participants: It is expected that participants will be craftsmen working in rural/urban areas whose attendance could only be for ½ day to allow them to earn their livehood. Alternate days with A & B groups to minimise travel costs could be a solution.

Equipment: Leyland-Albion and Scania Bus chassis are recommended with detachable backpart classroom & workshop facilities which can be transported to approved sites and collected later for the next site, without tying up the chassis unit during the course. Umbilical services of electricity, water etc. can be incorporated or a generator to produce 3 phase power provided.

Annexe 8

Title: ORIENTATION COURSE IN FOOTWEAR AND LEATHER PRODUCTS

Duration: 12 weeks

Objectives: The aim of this course is to provide a programme of introductory lectures closely followed by practical sessions which will provide a tempo of work for 'ab initio' students with no previous experience.

It is hoped that entrepreneural applicants will be sufficiently numerous in each course to introduce competing production groups, managed by each member of the group in turn.

A further aim is to produce simply made products for which the manual skills can be taught in minimum time, and which could be made available to the commercial market at a profit to the Institute.

Curriculum: It is imperative that this course is planned impeccably to ensure that the format of introductory lecture ($\frac{3}{4}$ hours) followed by guided practical sessions ($2\frac{3}{4}$ hours) has all the inputs of materials, tools and machinery, preprinted handouts and course support by technician staff to a high degree, to establish 33 hours each week of top quality practical instruction. (see detailed lesson plan)

Subject Headings:

1. The manufacture and use of natural and synthetic fibres. Fabric construction. Types of fabric and common uses. Methods of finishing and incorporation into products.

2. Types of Hides and Skins. Methods of preservation and tanning. Finishing procedures. Uses and relative values of different leathers.

3. The use of natural rubbers and synthetics as materials and components in footwear and leather product manufacture.

4. The manufacture and use of threads, braids and Laces.

5. The value and use of wood, cork and thermoplastics as components.

6. The use of metals, abrasives, waxes, finishes and gums.

7. Design of the product. Operational sequences prior to production.

8. Factory layouts for different scales of production. Production departments, machines in common use and sequences of operations in cutting, machining and making.

9. The place of hand processes in modern industry.

10. Development of practical skills, progressing from the simple to the more complex by means of specifically designed practise products.

WORK RATIO: THEORETICAL 27% PRACTICAL 73%

SPECIMEN

WEEK 1

BREAKDOWN OF SYLLABUS INTO PROGRESSIVE LESSON PLAN

Approx $\frac{3}{4}$ Hours LECTURE DEMONSTRATION MODULE	Approx $2\frac{3}{4}$ Hours PRACTICAL WORKSHOP MODULE
1. Introduction to subject	Preparation of note books, folios pre-course handouts etc.
2. Fabric constructions	Examination of structures and preparation of diagrams.
3. ditto	ditto
4. Methods of Fabric manufacture	Fabric analysis and recognition of cloths.
5. ditto	ditto
6. Fabrics used in footwear and Leather product production	Identification and mounting specimens in note books
7. ditto	ditto
8. Fabrics used as leather extenders reinforcers, strainers and plumpers	Practical usage techniques used for different purposes.
9. ditto	ditto
10. Relative costs of different fabrics. The effect of fibres	Complilation of fibre dossier price list for fibres, cloths combines, laminates and spreads.
11. ditto	ditto
12. Duplex cloths, combines spread cloths, leather graining, transfer coating etc.	Preparation of Diagrams showing processes. Duplex weaving. Simplex knitting. Jacquard.
13. Sources of hides and skins methods of temporary preservation	Fabric layout programme
14. Tanning and finishing cattle hides	Identification/mounting small sample specimens.

THEORY	PRACTICAL
WEEK 2	
15. Tanning and finishing goat skins. Characteristics of leather	Identification, specimen mounting, pattern layout on sides skins.
16. Leathers made from sheep skins & their characteristics	Identification wool and hair sheep leather by their characteristics.
17. Pig-hog-and exotic leathers. Characteristics and use.	Mounting photoprints to show types (actual too costly).
18. Printed and embossed leathers. Obliteration.	Experiments with dome plasticity equipment and moisture conditioning.
19. Fashion leathers for clothing, gloves and leisure wear.	Specimens and examples of usage. Substances for each.
20. Leathers used for soles, in-soles, luggage, saddlery, belts and sandals etc.	Preparation of specimens of types and commence cutting belt and sandal components.
21. ditto	Commence layouts on side leathers, goat & Sheep Skin.
22. ditto	ditto
23. Leather simulates in the roll	Layouts and cutting practice fabrics and simulates
24. Leather simulates (cont'd)	Layout & practise cutting fabrics simulates
WEEK 3	
25. Leather simulates cont'd.	Analytical cutting exercises for hand cutting with clicking knife.
26. Ditto	Component cutting in fabrics simulates and leather waste.
27. Composition/synthetic materials used for leather	ditto 25/26
28. ditto	ditto 25/26
29. ditto	ditto 25/26

30. Natural and Synthetic Rubbers; Origins, manufacture:	Cutting soles and insoles for practical programme.
31. Uses of Natural Synthetic Rubbers: components.	ditto
32. Cut components/moulded components.	ditto
33. Review of natural and Synthetic fibres	Simple identifying tests. Tensile strength testing.
34. Manufacture of threads laces and braids.	ditto
35. ditto	Cutting exercises and component assembly and counting
36. ditto (as 35 practical)	ditto

WEEK 4

THEORY	PRACTICAL
37. Wood, cork and other component materials.	Analytical Hand Cutting exercises. Introduction to pattern cutting. Forme Cutting demonstration.
38. ditto	Practical Forme Cutting - Herring bone and scotch tape method - Demonstration
39. Methods of component manufacture in wood, cork other materials.	Standard construction, footwear master patterns - leather products.
40. ditto	ditto
41. ditto	ditto
42. Metals & metallic components used in footwear & leather goods.	Component and lining pattern cutting.
43. ditto	Comparison of sizeing systems preparation of charts.
44. ditto	Analytical exercises and pattern cutting practise
45. Abrasives - types uses	ditto
46. ditto	ditto

47. Waxes - Natural, Synthetic and mineral	ditto
48. Brief summary of the anatomy of the foot	Taking plans - drafts and measurements of the foot.

WEEK 5

THEORY	PRACTICAL
49. Skin structure and its effects upon cut component quality.	Layout & marking up skins and sides ready for cutting.
50. ditto	ditto with emphasis on quality areas within the component.
51. Brief survey of cutting systems	Selective cutting - "All in" Cutting 'Runner pattern' cutting 2 quality
52. Introduction to material costing methods.	Cutting practise and accumulation of course components.
53. Pattern scaling including 1st waste allowance	ditto
54. Addition of 2nd waste allowance	ditto
55. Addition of other allowances and calculation of Target footage allowance.	ditto
56. ditto	ditto
57. Advantages of hand and machine cutting.	ditto
58. ditto	ditto
59. Hand and Machine cutting performances	ditto
60. International productivity results in cutting.	ditto
61. Preparation operations skiving - cementing, folding.	Skiving cementing and folding test pieces.
62. ditto	Hand skiving and splitting.
63. Preparation continued, strip folding cutonts perforation.	Fabric folding with tape reinforcement. (espadrille)

64. Other decorative treatments.	Tube/strip folding.
65. Types of edges	Preparation of drawings and samples of edges for leather and fabric usage.
66. Types of seams	Preparation of drawings and samples of types of actual seams possible on available equipment
67. Sequences of operations for practise shoes.	Sewing machine practise, without thread on graded exercises
68. Sequences of operations for main classic styles	ditto: but progressing from straight line machine control to gentle curves
69. Ditto for wallets/handbags	Ditto: progressing to peaks, points hairpin bends and other designs involving directional change.
70. Threading up and operating flat machines	Stitching up 1st practise shoe step by step - stage inspected.(Canvas espadrille with leather tip)
71. ditto Post machine	Folding to template leather note case involving straight folding, outside curves (pleated) inside curves (nicked)
72. ditto Cylinder arm machines.	Fitting and stitching shoe counter linings (grain leather reversed or split. Fitting and stitching up note-case.

WEEK 7

THEORY	PRACTICAL
73. Soles and insoles - materials available and relative costs	Preparation of insoles for practice shoes. 1. Canvas/Canvas laminated 2. Veg.tan. shoulder/light bend 3. 4 Iron shoulder/bend.
74. Ditto including heels with preparation for different purposes.	Insert leather stiffener and hand last canvas espadrille 1. (thermoplastic stiffener if available)
75. Sole lamination techniques Leather/ Leather including chrome split	ditto

76.	Leather sole inserts with P.V.C. edge and heel injection	Prepare soles and insoles and hand last strip sandal 2. with cement - tacks or staple tacker.
77.	Types of lasts for sandal shoes boots and slippers, differences between feet and lasts.	ditto
78.	Preparation, and sequences for hand lasting "cements" construction.	Prepare soles and insoles and hand last open waist sandal. Tasted inserted toe stiffener.
79.	Theory of balanced lasting pulls, toe and seat pleating.	ditto
80.	Bottom levelling, pleat trumming, bottom filling and shanking.	Trim pleats, flatten bottoms by hammering or pounding bottom fill and shank. Remove insole tacks.
81.	Lasting and sole attaching adhesives: Choice for different purposes and applications.	Cement bottoms and soles activate - spot and attach under sole press or wooden mallet.
82.	Detailed sequences and making instructions for practise shoe 1. Espadrille	Attach heels unless pre-attached to make sole units - which could be pre-finished before attaching.
83.	Ditto. Practise shoe 2. Leather sole and insole sandal, non-stitched folded or R/E strips.	Heel and edge trim if not units, but move unit preparation to 73.
84.	Ditto open waist womens raw edge sandal. Practise shoe 3. Leather board insole.	Scour and finish bottoms with light gum finish and frixim map.
85.	Introduction to types of cleaners and dressings.	Seat socking or whole socking if metallic lasted
86.	Cleaning and finishing methods. Ironing & wrinkle chasing with heat	Clean linings and outsides.
87.	Spray dressing techniques for shoe uppers, bottoms and leather products	Iron and wrinkle chase shoes and note cases
88.	Quarter reforming shoes, folding and clamping note case.	Wax and set raw edge inner panel on note case (rub clean with cloth).

WEEK 8

89. Methods & costs of packaging and packing.	Dress shoes using different methods 1. Cleaning solvent. Canvas 2. Resin emulsion or wax/soap on shoes and leather products.
90. Appreciation of Costing Estimating & elements of cost.	Hand and machine polishing including antiquing.
91. Importance of productivity and its effects on overheads, fixed and variable.	Tissue wrapping & boxing, bagging or other packaging.
92. Recapitulation on Cutting stitching & making programme. Wrapping and Cutting by knife.	Methods of wrapping fabric lays, hand, simple hook and roller device. Mechanical wrap table (theory)
93. Using practise shoe 1 press cut. Cost comparisons and effects on productivity.	Location stapling and multilayer cutting with forged knives (insoles) cold bend knives (uppers) including hand combining.
94. Twin needle stitching and under taping.	Hand stamping - size - serial no. machine cementing and folding.
95. Non woven thermo plastic counter and toe puffs.	Back seaming - reinforcing toe puff ironing twin row taping vamps & quarters. Twin row sides
96. Combined forepart and machine seat lasting. Machines & Method.	Counter lining - upper checking Commence Combined forepart lasting.

WEEK 9

97. Machine lasting methods (continued)	Individual forepart lasting instruction and supervision (shoe).
98. ditto	Individual side and seat lasting.
99. ditto	Pounding - bottom ironing.
100. ditto	Tack removing - Bottom filling, shanking.
101. Alternative methods of making & sole/heel attaching, cemented shoes.	Cementing & Sole attaching including pre-attached heels.
102. ditto	Last slipping, fault analysis and packaging (spot cleaning where necessary)

103.	Advantages of division of labour. Responsibility balanced by authority in foremanship.	Repeat using shoe 1. But using course in A&B teams competing in productivity & quality.
104.	Constructions & Methods	ditto with a different member of each team as production foreman - (Institute staff advise only).
105.	Constructions & Methods	ditto each half day until all have "been in charge" once, to learn that authority = responsibility.
106.	"	"
107.	"	"
108.	"	"
109.	Seminar and analysis of success of team production	Continue producing practise shoe 1.
110.	Resolution of problems which reduce productivity & quality	ditto
111.	Calculation of Costs of material used each session	ditto
112.	Calculation of labour (man hours per pair)	ditto
113.	ditto 11	ditto
114.	ditto 12	ditto
115.	Seminar - Planning for team production strip sandal 2.	Group production by A & B team. sandal 2. lessons 76/77 refer.
116.	Analysis and Costing	ditto using strip cutter, cutting press and finishing equipment. Remainder hand tools.
117.	ditto	ditto
118.	ditto	ditto
119.	ditto	ditto
120.	ditto	ditto

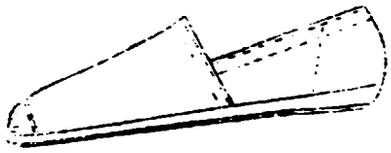
WEEK 11

THEORY	PRACTICAL
121. Sandal analysis & costing	Sandal production continued.
122. ditto	ditto
123. ditto	ditto
124. ditto	ditto
125. ditto	ditto
126. ditto	ditto
127. Analysis & costing for materials - Practise shoe 3.	Recapitulation lessons 78-79. Team production of open waist sandal.
128. ditto	ditto
129. ditto	ditto
130. ditto	ditto
131. ditto	ditto
132. ditto + Batch productivity	ditto

WEEK 12

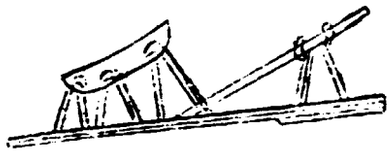
THEORY	PRACTICAL
133. Introduction to belt making	Designing, cutting & making belts
134. Methods of decoration	Men's dress belts. Methods of cutting and stitching.
135. Buckles and fastenings	Women's fashion belts.
136. Lining techniques	ditto
137. Purse & note-case design	cutting patterns and make up
138. ditto	ditto
139. ditto	ditto
140. ditto	ditto
141. Sling bags method of making	Making sling bag stock pattern
142. Clutchbags ditto	Making clutchbag, stock pattern
143. Framebags ditto	Frame bag technique, stock pattern
144. Plenary session and seminar	Clearing up un-finished work and discussion on future innovation.

Shoe 1.

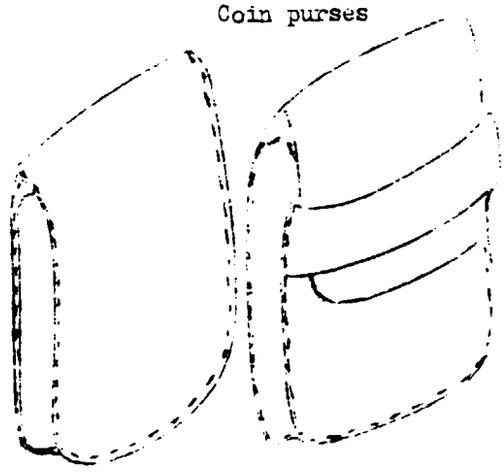


Notecase

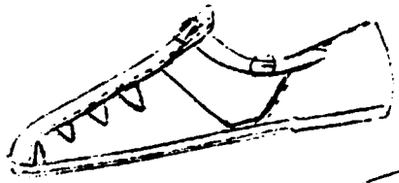
Shoe 2.



Coin purses



Shoe 3.



Belts.

Annexe 9

Title: BASIC OPERATIVE CERTIFICATE COURSE

Duration: 4 Weeks

Objectives:

To give a general appraisal of the footwear and leather product industries as they affect the machine operative or process worker.

To introduce simple informational programmes on the making of leather, manufacture of boots and shoes, and leather goods production.

To present departmental detail of operators own department, and the sequence of operations for different types of production.

To give progressive analytical training on operatives own machine.

To outline safety precautions, set-up and adjustment procedures.

To present normal and abnormal operation practices and performance.

To present quality standards on own machine.

To be capable of meeting expected production targets on own machine.

Curriculum:

- Brief history of leather making and production of chrome leather.
- Brief history of shoemaking with departments and modern procedures.
- Outline of the categories of leather goods and their production sequences.
- Tolerances and quality standards in candidates own process.
- Economy in the use of materials, especially chemical and accessory imports.

- Care of equipment and machinery, especially in high humidity areas.

- Cleanliness, tidyness, careful adjustment and regular oiling/greasing.

- Upon completion of training the operator should be able to pass a practical and oral test in the following:

- Safety precautions and dangers to be avoided in own process.

- Have complete understanding of all levers, slides, operating pedals and adjustments involved in own process or machine.

- Be able to set up and adjust for different applications.

- Be aware of all the likely common faults and how to avoid them.

- Be fully conversant with the end-of-shift cleandown and leave-safe routine.

- Be conversant with the power source of own process and how it is transmitted to the work area.

- Be able to operate the machine or process at slow speeds.

- Be able to operate at normal speeds producing work of an acceptable standard.

Operations and Processes: for which training and testing should be available.

Pattern cutting:	Forme cutting and standard construction. Master leather goods patterns, sectioning into component parts. Making metal or plastic grading models. Grading in pattern sets. Brass binding. Marker making.
Leather cutting:	Leather lining cutting by hand or press. Mult layer cutting of roll materials. Cutting outside leathers.

Preparation: and	Skiving, folding, splitting, cementing, die punching, linear perforation, backing and reinforcement, HF. Weldingand flow moulding.
Stitching:	Stitching to commercial standards on flat, cylinder-arm and post machines one category of work from normal production programme.
Lasting: and	Back-part moulding, seat lasting, combined pulling over and forepart lasting, pulling over, toe lasting, waist and side lasting, stiffener dip and insertion, hand draftin and lasting, surplus upper trimming.
Making:	Mouding with toe scouring, upper roughing, upper cementing, shanking, bottom filling, activation, spotting and sole attaching. Rand attaching, heel attaching, pieced sole attaching and seat nailing, welt sewing, trimming and beating, welt butting and tacking, solutioning and sole laying, rough rounding, sole stitching, channel cementing and laying, outside heel attaching. Seat flanging, toe forming, upper and sole cementing, Veldt assembly, Veldt stitching inc. seats, surplus upper trimming, cementing and sole/heel attachment. Feet and mould change, set-up and pull on leg, injection moulding and slipping, Flash trimming.
Finishing: and Shoe room:	Edge-trimming and jointing, Heel scouring, Edge inking and Heel inking, padding and seat wheeling. Bottom scouring Bottom making (spray, brush, sponge or mag). Bottom padding, final heel attaching (after temporary). Sock stamping, socking, panel trimming, upper cleaning and suede cleaning Ironing, hot blasting and wrinklechasing. Dressing, antiquing and polishing, upper spraying, ornament attaching, quarter reforming, labelling tissueing and boxing.
Bottom stock:	Sole and insole cutting, roughing and cementing, channelling and grooving, Pre-trimming, sealing and pre-finishing, heel building nailing and compressing.

Leather Goods:

Due to the extensive range it is only possible to generalise on training in the following categories which are quite similar to those listed above.

Cutting linings, reinforcements and outsides by hand or press. Skiving, folding, rucheing, fitting, stitching, rivetting, eycletting, framing, handle fitting, pressing and polishing are merely an outline of specific training and tests which should follow as the industry develops.

RATIO PRACTICAL/THEORETICAL INSTRUCTION:	80% PRACTICAL 20% THEORETICAL

Annexe 10

Title: HIGHER OPERATIVE CERTIFICATE

Duration: 4 weeks for Basic operative certificate holders
8 weeks for first entrants.

Objectives: The aim of the course is to link individual, analytical machine training and process instruction with a view to:

a. Producing utility operatives with a degree of departmental versatility.

b. Introducing the first step in a line management programme for selected operators whose potential for advancement to foreman status is being tested.

c. Training in three major operations or processes from a production sequence to appropriate levels of performance.

d. Presenting the same theoretical programme of general instruction as that of the BASIC OPERATIVE CERTIFICATE for new entrants.

Curriculum:

1. Design, Pattern - cutting and Pattern making

a. Forme cutting and standard construction.
b. Component sectioning and specification interpretation.
c. Pattern making.
d. Grading.
e. Model making.
f. Eyeletting and brass-binding board patterns.
g. Marker making.

2. Leather Cutting

a. Sorting, selection, storage and issue of leather.
b. Cutting to appropriate levels of quality (minimum 100 pieces) within a proven target feetage.
c. Comparison between leathers used in the department and target allowances, calculation of profit or loss on 10 issues to other cutters.

3. Preparation, Machining and Finishing off

   a. Training on three preparation machines in sequence:
   Skiving - Cementing - Folding - Die-punching - Linear perforating - Flow moulding.

   b. Flat machining, cylinder-arm and post machining, HF. Welding. or three different applications or processes on the same machine to commercial standards.

4. Lasting and Making:

   a. Backpart moulding.
   b. Seat lasting.
   c. Combined pulling over and forepart lasting.
   d. Pulling over.
   e. Toe lasting.
   f. Waist and side lasting.
   g. Stiffener dipping and inserting.
   h. Hand drafting and handlasting.
   i. Surplus upper trimming.
   j. Pounding and toe scouring.
   k. Upper roughing.
   l. Upper cementing.
   m. Shanking and bottom filling.
   n. Activation, spotting and sole attaching.
   o. Rand attaching.
   p. Heel attaching.
   q. Pieced sole attaching.
   r. Seat nailing.
   s. Welt sewing trimming and beating.
   t. Welt butting and tacking.
   u. Solutioning and sole laying.
   v. Rough rounding.
   w. Sole stitching.
   x. Channel cementing and laying.
   y. Outside heel attaching.

5. Stitchdown - Veldtschoen Processes

a. Seat flanging
b. Toe forming.
c. Upper and sole cementing.
d. Upper and sole assembly.
e. Stitching all round.
f. Surplus upper trimming.
g. Cementing and attachment of soles and heels.

6. Injection moulding.

a. Feet and mould changing.
b. Setting up and pulling on leg.
c. Injection moulding and slipping.
d. Flash trimming.

7. Finishing and shoe room:

a. Edge trimming and jointing.
b. Heel scouring.
c. Edge inking and setting.
d. Heel inking, padding and seat wheeling.
e. Bottom scouring.
f. Bottom inking-spray - brush - sponge or rag.
g. Bottom padding.
h. Final heel attaching (after temporary)
i. Sock stamping.
j. Socking.
k. Panel trimming.
l. Upper and suede cleaning.
m. Ironing, hot-blasting and wrinkle chasing.
n. Dressing.
o. Antiquing and polishing.
p. Upper spraying.
q. Ornament attaching.
r. Quarter reforming.
s. Label, tissue and boxing.

8. Botton stock department

a. Sole and insole cutting.
b. Roughing and cementing.
c. Channelling and grooving.
d. Pretrimming, sealing and prefinishing.
e. Heel building, nailing and compressing.

9. Leather Goods:

a. Cutting outsides and linings.
b. Cutting reinforcers, sugar papers, foam, boards.
c. Skiving.
d. Sleek boning and folding.
e. Rucheing
f. Cementing and first fitting.
g. Lining make up.
h. Assembling outside.
i. Cementing and second fitting.
j. Rivetting and eyeletting.
k. Frame fitting clenching.
l. Handle fitting.
m. Pressing and polishing.
n. Padding, tissue wrapping and boxing.

RATIO THEORETICAL/PRACTICAL INSTRUCTION:	THEORETICAL	20%
	PRACTICAL	80%

Title: MATERIALS TESTING FOR LEATHER & RUBBER INDUSTRIES

Duration: 8 weeks - This course will normally be run in co-operation with Tanners Materials Testing Course for 3 weeks during their physical and chemical test programme on leathers.

Objectives:

To demonstrate the continuing need to maintain quality standards in materials and processes by means of physical and chemical tests.

To give an appreciation of satisfactory standards and to high-light unsatisfactory quality levels in leather product materials.

To co-operate in the compilation of minimum specification data for use within industry.

To make students aware of the minimum range of tests which they would need to use in industry, and which the Institute might offer as a service at reasonable cost.

To give instruction concerning report writing and interpretation of data.

Curriculum:

1. Presentation of the standards required in the characteristics and properties of leather and other materials used in footwear and leather product production.

2. Accumulation of data and its interpretation to control standards.

3. Sampling and sampling positions, number and sequence of specimens, specimen preparation.

4. Physical Test Programme for Leather, Boards, Textiles, Rubber, Adhesives and other materials used in the production of footwear and leather products:

5. Chemical test programme for Leather, Boards, Textiles, Rubber, Adhesives and other materials used in the production of footwear.

6. Interpretation of data and report writing.

7. Detail of Physical Test Programme for Leather Products Industries

Leather:

Tensile strength.
Maximum elongation at break.
Lastometer test.
Dome plasticity test.
Stitch tear.
Split tear.
Bursting strength.
Water absorption.
Fastness to flexing.
Fastness to rubbing.
Fastness to water.
Resistance to heat.

Simple factory tests.

General appearance.
Thickness and quality.
Uniformity of colour,
Uniformity of grain.
Uniformity of surface texture.
Uniformity of break.
Grain crackiness (double fold test)
Key test for grain crack.
Handerchief wet/dry rub.
Scotch tape test.
Crepe rub test.

Rubber:

Sampling and preparation of specimens.
State of cure test.
Ageing test.
Relative density.

Board:

Substance and Density.
Water absorption.
Tensile strength.
Stitch tear.
Tack hold.
Flexing endurance.

Textiles:

Identification of fibres.
Intrinsic fibre strength.
Thickness and longitudinal extension.
Standard moisture regain.
Yarn count, strength and elasticity.
Reed and pick calculation.
Degree and direction of yarn twist.
Yarn weight calculation.
Tensile strength of fabric
Tear Strength of fabric.
Strength and stretch balance.
Elasticity and plasticity.
Laces and threads; Strength, stretch and abrasion.

Adhesives:

Materials used for test bases.
Standard test joints for (a) Canvas. (b) Sole leather. (c) Upper leather.

Tensile strength at break.
Stretch at break.
Tensile modulus.
Stitch tear
Compression set (permanent)
Extension set (permanent)
Hardness.
Abrasion resistance.
Resistance to flex cracking.
Cut growth.
Stiffness index.
Cold temperature flexing.
Creep testing.
Determination of adhesive strength.
Peel testing.
Shear testing.
Tension testing.

Miscellaneous Tests.

In addition to the above tests there are also an array of physical tests for shoe and leather product compnents: Metallics. Toepuffs. Bottom fillings. Platform materials. Shanks. Heels. Eyelets and Zip Fasteners.

8. Detail of Chemical Test Programme for Leather Product Industries.

Leather

Burning tests-Veg. Tanned.
Chrome tan, semi-chrome, and Chrome retan leathers.
Boiling Tests) veg.Tan and Semi Shrinkage tests)
Chrome tannages. Full chrome and alum dressed.
Iron salt test
Fixed Tans.
Acidity.
Burning for Chrome and non-chrome.Fungus and mould detection.
Free sulphur test.
Percentage Chrome Oxide test.
Minimum ash.
P/H of Water Solubles.
Degree of Tannage.
Moisture content.
Fat content.
Ashed water Solubles
Ashed water insolubles.

Textiles:

Mineral salt loading.
Organic dressing.
Tests for rot resistant agents.
Soil rotting tests.
Determination of dye types.

Leather Board, Boards and Papers.

Oil and Fat content.
Leather content.

Rubber.

Analysis of mix formula
Percentage rubber to fillers.

Adhesives.

Determination of solid content.
Determination of viscosity.

Participants: It is recommended that participants will normally have had a secondary education to Form IV with laboratory experience, recording of data, calculation and interpretation.

RATIO THEORETICAL/PRACTICAL INSTRUCTION: THEORETICAL 2%
PRACTICAL 78%

Title: PRODUCTION MANAGEMENT

Duration: 4 weeks.

Objectives: The course is designed for managers, supervisors, and technologists engaged in the manufacture of boots, shoes and other leather products.

The main aim of the programme is to improve the knowledge, skill and competance in the field of production management for executives, technicians and others who hold, or who are expected to hold in the future, managerial, supervisory or organisational posts in leather product manufacture. The course content will be specifically designed in such a way as to use examples from the leather product industries: all theoretical work plans, machine, departmental layouts, cost data and storage facilities will have relevance in footwear and leather product manufacture.

Curriculum:

1. General Principles: Economic aspects of production. Sources of costs and their control at production level. Integration and co-ordination of production. Profit forecasting with planned targets and cost estimates.

2. Production Planning: Choice of location. Plant layouts. Means of transport for materials and personnel. Handling equipment. Choice of materials, machines, and equipment. Methods and procedures for implementation.

3. Production Control: Ordering methods and systems. Collation of information, materials and components. Inventories. Long-term, short-term and annual forward planning. Progressing and dispatching.

4. Purchasing: Evaluation of needs, Purchasing methods and ordering systems. Purchase of supplies and consumer goods replacement. Purchase contracts and terms of settlement. Spares replacement purchasing.

5. Storage: Stores management and its position of importance in the work plan. Handling. Stock protection. Deterioration and obsolescence. Waste analysis.

6. Maintenance: Preventive maintenance. Breakdown maintenance. Over-haul and cost of "down time"

7. Factors effecting the daily work-plan: Availability of lasts, moulds, formers. Capacities of cutting, preparation, machining and other processes. Availability of materials and components. Use of specifications and work tickets to co-ordinate the the work plan. Effective work monitoring techniques. "Bottle-neck" clearing procedures. "Rush" and special day-sheeting. Relative merits of computorized monitoring for materials control and progress control.

8. Production management performance review: Variance analysis of operational performance. Assessment of effectiveness. Efficiency measurement at departmental and plant level.

Note:

It is hoped that the manufacturing organisations will be able to provide actual work scheduling problems for resolution by the staff and students from this course.

RATIO PRACTICAL/THEORETICAL INSTRUCTION:	25% INPUT LECTURES 25% SEMINARS 50% DEVELOPMENT OF PRACTICAL PLANS FOR DIFFERENT SCALES OF PRODUCTION

Annexe 13

Title: PROCESS AND QUALITY CONTROL IN THE LEATHER PRODUCT INDUSTRIES

Duration: 4 Weeks

Objectives: To enumerate the principles of quality and process control.

To outline methods of installing process and quality control systems in footwear and leather goods factories.

To show how variability in product quality can be minimised.

To emphasise the importance of feed-back in the maintenance of product quality.

To show how planned machine maintenance assists in quality control.

To identify the role of top management in the establishment of standards and quality levels.

Curriculum:

1. Study of Established Standards and Methods of Control.

   (a) National and International Standards, their availability and publication source.

   (b) Mandatory and optional specifications.

   (c) Acquisition of specialist papers, research reports and specifications from Institutes, Research Associations and Higher Educational Establishments, linked with detailed study programme.

   (d) Compilation of schedules detailing control levels for materials components, machine settings, and processs qualities.

   (e) Appraisal and interpretation of data.

   (f) Endorsement by top management of control levels and minimum standards.

(g) Circumstances for, and methods of amending, up-grading and improving established standards.

2. Establishment of tests and procedures for checking incoming materials and components:
(see detailed test list, material testing syllabus)

(a) Random sampling for suitability, quality, colour, size or measurement.

(b) Percentage of consignment check.

(c) Amount, quantity, weight or number count.

(d) Comparison with original sample.

3. Process Control Systems:

(a) The use of electric, electronic, mechanical and other equipment for measuring, monitoring, counting, assessing, marking, controlling and recording.

(b) The value of visual examination within prescribed limits for all processes and materials.

(c) Reasons for drops in quality during production runs.

(d) Preparation of master list of associated faults for each process, operation or examination station.

(e) Methods of observation and recording during initial running-in period.

(f) Preparation of examiners record sheets for each examination station.

(g) Establishment of 'control limits' for each examination station.

(h) Procedures for dealing with work out of control or below the control limit.

(i) The examiner's route.

(j) Sampling from conveyors, work trolleys and pools of work.

(k) Methods of arriving at a quality index for each examination point.

(l) Methods of ensuring that control limits are always within the final 'pass' standard.

(m) The role of top management in the interpretation of control data.

(n) The provision of graphs, charts and periodic summaries as means of progressive improvement.

(o) The human factor. How quality and process control systems might be viewed by operatives, examinars, foremen, quality supervisors and managing directors.

4. The effect of correct set-up and machine maintenance on work quality:

(a) Laying down tolerances for acceptable machine operation.

(b) Provision of pre-check list for setting up.

(c) Interchange of sub-tools and accessories to widen machine scope.

(d) Establishment of acceptable finished work standards.

(e) Routine for regular inspection and servicing.

RATION PRACTICAL/THEORETICAL INSTRUCTION

25% LECTURE INPUT
25% SEMINARS/DISCUSSIONS
50% PRACTICAL DEVELOPMENT OF FAULTS LISTS, RECORDING METHODS, ANALYSIS AND QUALITY LEVEL SUMMARIES

Annexe 14

Title: DEPARTMENTAL AND GENERAL MANAGEMENT COURSE FOR FOREMEN

Duration: 2 weeks

Objectives: To give an insight into the structure of management.

To improve participants knowledge of Management Policy, its formulation, implementation and subsequent review procedures.

To identify the foreman and his role in the management team.

To emphasise the importance of cost control and high productivity particularly at departmental level.

To provide strategies, techniques and practices needed for departmental control and control data needed at higher levels.

To provide detail and interpretation in labour legislation.

Curriculum:

1. Definition of policy, how it is formed and implemented.

2. Organisations, Structures, relationships Authority, responsibility, delegation, direction and motivation.

3. Control and adherance to planned objectives
Definition of variances and their use as a control instrument.

4. The importance to high productivity at departmental level. Techniques for maintaining or improving productivity and lowering labour and materials costs.

5. Waste control techniques: Cost of ineffective material control and its effects on selling price and competitiveness.

6. The cost of non-productive labour: Cost of supervision and other activities which do not contribute to the product.

7. Incentive schemes: financial and non-financial.

8. Self assessment programmes for foremen.

NOTE: To enable the volume of work to be accomplished it is suggested that this course is preceeded with pre-course handouts and reading instructions, and heavily supported with prepared material during the course.

40% THEORETICAL LECTURE INPUT
60% SEMINARS, DISCUSSION GROUPDS, CASE STUDIES

Annexe 15

Title: GENERAL MANAGEMENT FOR SUPERVISORS AND INSPECTORS

Duration: 2 Weeks

Objectives: To augment experience and knowledge acquired at the foreman level course.

To provide improved knowledge of those practices and techniques which can be used in the management of industrial enterprises.

To provide improved skills in management practise, review and revision.

To provide facilities for learning and improving.

Curriculum:

1. Organisational strategy and policy formulation:
2. Programming and budgeting:
3. Organisational planning and development
4. Resource Assembly:
5. Personnel and labour management:
6. Functional integration in general management
   - (a) Purchase & supply.
   - (b) Product engineering.
   - (c) Production planning and control.
   - (d) Maintenance.
   - (e) Quality control.
   - (f) Inventory control.
7. Finance and Accounting:
   - (a) Source and cost of funds.
   - (b) Allocation of budgets.
   - (c) Financial accounging.
   - (d) Cost accounting.
   - (e) Profit control.
   - (f) Capital investment control.
   - (g) Information recording, reporting and control.

Annexe 16

Title: COURSE FOR SEWING MACHINE MECHANICS

Duration: 3 weeks

Objectives: The aim of this course is to broaden the range of experience of mechanics specialising on sewing machines.

It seeks to extend the range of knowledge concerning the range of machines available, methods of conversion for different purposes and incorporation of peripheral equipment to increase productivity.

To install the concept of planned & routine maintenance, adequately recorded and above all to give practical instruction and guided experience in fault diagnosis with setting up for perfect running.

Curriculum:

1. Machine Mounting and transmission:
   Transmitters - Clutch motors - Stop-right and other special motors.

2. Stitch and feed mechanisms:
   (a) Stitch forming and adjusting mechanisms.
   (b) Stop, continuous wheel under feed and other feed mechanisms.
   (c) Types of presser foot, and their purpose.
   (d) Upper feed wheels, loose and powered.

3. Fault diagnosis:
   (a) Check lists for fault elimination
   (b) Practical adjustment and tunning experience.
   (c) Simple setting up tools for specific work.

4. Maintenance:
   (a) Daily and weekly cleaning and maintenance (Operative).
   (b) Periodic maintenance to schedule (mechanic).
   (c) Maintenance records.

5. Automatics:
   Applications of electronic and other control systems for stitching and work transfer.

6. Guides and attachments available from stock and made to measure.

7. Worn part recovery techniques:

   Butane torch brazing - heat dissipation techniques.
   Metal spraying.

This syllabus will require considerable preplanning to ensure that note taking is reduced to the minimum; handouts are available for all subjects and the ratio of theory to practical work does not exceed 15% theory - 85% practical. With emphasis on manual skill as their main asset it is probable most mechanics would prefer lecture - demonstration modes of learning. Supported by diagrams and summaries.

ANNEX 17

RECOMMENDED TEXT BOOKS, MANUALS PERIODICALS AND OTHER PRINTED MATERIAL

1.	Arpel (quarterly)	via Nievo 33, Milan 20145 Italy
2.	Ars Sutoria (quarterly)	via Nievo 33, Milan 20145 Italy
3.	Annotated Directory	ITC 1211 Geneva Switzerland
4.	Of Product Journals	" "
5.	Fotoshoe	Tratsart Agency London UK.
6.	Fashion Weekly	Tratsart Agency London UK.
7.	Fashion Forecast	Satra Kettering UK
8.	Footwear Materials and Processes	W.E. Cohn Fairchild Book Div. 7.E. 12 ST N.Y. USA
9.	Footwear Industry	. . Fairchild Book Div. 7.E. 12 ST N.Y. USA.
10.	Footwear News Fair child press	. . Fairchild Book Div. 7.E. 12 ST N.Y. USA.
11.	Herren Schuh	Tratsart Agency London UK
12.	Handbags and Leather Goods	W.C. Double Cordwainers Coll. London UK
13.	Leather	Benn Publications London.
14.	Leather Goods	9 St Thomas St. London SEI.
15.	Leather Goods Buyer	9 St. Thomas St. London SEI
16.	Luggage and Leather Goods	Hare Publishing III 4th Ave. N.Y. 10003 USA
17.	Liri Publications	Grahamstown South Africa
18.	Leder.	Tratsart Agency London UK
19.	Leather Workers Hand book	J.H. Sharp house Northampton Nene College.
20.	Maroquinerie, Sellerie et Bagages	Delacroixet Johanet
21.		7 Rue hauriston 75 Paris 16^{e} France
22.	Maroquinerie voyage, Paraplue	Asteria & Rue Greffu the 75 Paris 8^{e} France.

23.	Moda in Pelle - Impula	Blrd. Arno Firenze Italy
24.	Moda piel	Tratzart Agency London.
25.	Mipel	via San Gregorio 12 Milan Italy
26.	Manual of Cost Accounting for the Footwear Industry	Footwear manufacturers Federation London UK
27.	Manual of Shoemaking	C&J Clark Ltd. Street Somerset UK
28.	Process control for Shoe Factories	TM. 1204 (Revised) Satra Kettering UK.
29.	Pattern Cutting for Shoemaking	T.H. Patrick. Hobbs-Miller Carrington St Kellering UK.
30.	Revue Technique des Industries	Du Cuir. 54 Rue Rene Boulanger 75 Paris 10^{e} France.
31.	Shoes and Views Pty. Box 3084	Port Elizabeth South Africa.
32.	Shoe Products Daily	Melhado Publishing Co, 210 Lincoln St Boston, Mass 02111 USA.
33.		
34.	Shoe and Leather News	84-88 Gt. Eastern St. London Ec2
35.	Show Reviews	Satra Kettering UK
36.	Shoe Making Operations and their Associated Faults	T.M 1377 Satra Kettering UK
37.		
38.	Shoe Technology Manuals	Satra Kettering UK
39.	Technical Manual of Shoemaking	CTC 181 Av. Jean Jawes
40.	Technical Manual of Leather Goods making.	169 Lyen 7^{e} Rlone France
41.	Techniouir	54 Rue Rene Boulanger 75 Paris 10^{e} France.
42.	Textbook of Shoe Manufacture	C&J Clark, Street, Uk
43.	Textbook of Footwear Manufacture	J.H. Thornton Butterworth
44.	Textbook of Footwear Materials	J.H. Thornton Press Kingsway London UK
45.	Training Manual and Analytical	GMC exercises Satra

ANNEXE 18

LIAISON WITH INDUSTRY

Liaison with the defferent locations of industry will be difficult, time consuming and expensive due to the distances involved, so for this reason it is probable that only the Director and the Senior Staff of divisions will be able to liaise with industry on a regular basic.

It is possible, however, for regular bulletins and information sheets to be posted keeping industry informed about development work at relatively low cost, and pre-earning work carried out in product design.

The preparation of operation manuals for use within the factories would be a natural development from Institute training manuals, and this also could be used as a means of raising income.

Liaison with associated industries which are above to make a conditribution in the filed of import substitution and utilisation of national materials, is an important area upon which to concentrate in the immediate future, and essential if the Institute staff wish to be working at the forentiers of knowledge.

ANNEX 19

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Suggested Organizational Structure for T.I.L.T.

BOARD OF DIRECTORS OF THE TANZANIAN INSTITUTE OF LEATHER TECHNOLOGY

DIRECTOR

P.A. SECRETARY

INFORMATION

INFORMATION SCIENTIST
PROGRAM WRITER
LIBRARIAN
ASSISTANT LIBRARIAN
PRESS OFFICER

TRAINING - RESEARCH AND DEVELOPMENT

LEATHER MANUFACTURE

HIDE SECTION
S.L.T.
J.L.T.s
TECH. 1
TECH. 2
Key Operator

SKIN SECTION
S.L.T.
J.L.T.s
TECH.1
TECH.2

LEATHER PRODUCTS/FOOTWEAR

S.L.P.T.
J.L.P.T.s
TECH.Cutting
TECH.Fitting and Stitching

S.F.T.
J.F.T.s
TECH. Cutting
TECH.Stitching
TECH.Making

STANDARDS AND QUALITY

S.L.C.

J.L.C. Chemical Tests
Lab.attendant

J.L.C. Physical Tests
Lab.attendant

MAINTENANCE

ENGINEER TANNERY
Eng. Tech 1
Eng. Tech 2

ENGINEER FW/LP.
Eng. Tech 1
Eng. Tech 2

ADMINISTRATION

OFFICE MANAGER
PURCHASE
STORES
ACCOUNTS
TYPISTS
TELEPHONIST
DRIVERS
SECURITY
CLEANERS
HOSTEL WARDEN
HOSTEL STAFF

ANNEX 20

ADDITIONAL HAND TOOLS AND EQUIPMENT

The machinery and equipment already imported or on order for use in the Institute should be adequate, especially when it is augmented with machines from Morogoro, but certain hand tools and simple bench mounted items might be needed for leather goods training.

The following additional items are suggested:

1. 1 Hand or powered strap cutting machine (width adjustment)
20 Hand cutting tables (local production)
10 Collapsible trestle tables (production)
20 Kamb. scribers
1 Lotts or similar handbag framer Dies for above - Inverted, side opening & push-up.
5. Pairs of toggle pliers
5 Pairs push-up pliers
20 Pairs size 0 Lasting pincers
5 Pairs frame opening pliers
5 Frame introducers (converted point scrapers).
10 Skarston scrapers.
1 Treadle unit and dies for tubuler rivets
20 Hand punching pliers (Maun Industries Mansfield UK)
Qty spare tubes and thonging dies.
3 Vitreous enamel lined plateing pots.
1 Lowvoltage transformar and ammeter/voltmeter.
200 Tugtite catches - Large - Medium and small.
200 Concealed press studs
200 Sets corner reinforcers
200 Dome press studs - nickel Large/Medium/Small
200 Bag handle clenchers (mild steel) Qty. of plain and adhesive tape.
200 Miscellaneous Italian, Spanish and German Belt Buckles
Qty White, black and coloured combined canvas.
Qty cellophane string for handle reinforcement
Qty sugar paper
Qty Light mill board
Qty P.U. foam
Qty strainer board

Qty Biforcated bottom dones

1 Engineers fly press and buckle dies.

Selection of Locks, Catches, Frames, hinges locks and other pressings for demonstration.