



**SOKOINE UNIVERSITY OF AGRICULTURE**

**COLLEGE OF AGRICULTURE**

**DEPARTMENT OF ENGINEERING SCIENCES AND TECHNOLOGY**

**FIELD PRACTICAL TRAINING (FPT) GUIDELINES**

**FOR**

**BSc. IRRIGATION AND WATER RESOURCES ENGINEERING**

**DEGREE PROGRAMME**

**2016**

## 1. IMPORTANCE OF FIELD PRACTICAL TRAINING

### 1.1. Introduction

The BSc. Irrigation and water resources engineering degree programme is one of the degree programmes that are offered at Sokoine University of Agriculture (SUA). This degree programme aims at producing graduates who will put engineering profession in irrigated agricultural production, water resources development and environment protection and management. This is possible through tailor-made training curriculum that imparts knowledge derived from engineering and other disciplines into the following main areas:

- Irrigation systems design and management
- Water supply and waste water systems design and management
- Soil and water management
- Irrigation structures design, construction and management.

In addition to passing examinations in the above-mentioned areas of specialization, another major requirement for this degree programme is that students have to go through Field Practical Training (FPT) during the inter-session periods (July – September) in 1<sup>st</sup> (FPT1), 2<sup>nd</sup> (FPT2) and 3<sup>rd</sup> (FPT3) year of study for a period of **eight weeks**.

Field Practical Training provides opportunity for students to merge theoretical knowledge gained in class and actual field practice. It therefore offers training in a real-life situation which cannot be simulated in lecture rooms, laboratories or departmental field plots. FPT involves attachment of students to irrigation projects, schemes, large-scale farms and allied institutions. A special committee comprising of field practical supervisors shall make the assessment of the field practical training. A pass in the FPT shall be required before a candidate is allowed to proceed to the next year of study.

### 1.2. Objectives of FPT

#### 1.2.1 General objective

The general objective of FPT for BSc Irrigation and Water Resources Engineering is to enable the students to get hands-on practical irrigation engineering skills to complement theoretical and practical instructions offered at the University. As such, successful completion of all the three FPT is one of the requirements for registration of our students by the Engineers Registration Board (ERB).

### **1.2.2 The specific objectives for students undertaking FPT are to:**

- give students an opportunity to apply theoretical knowledge and skills gained in class to real practice situations and develop the ability to work under real practical field conditions in large scale farms and irrigation schemes
- gain practical experience and knowledge in irrigated agriculture and land and water resources development at different levels,
- give students a chance to know organizational and managerial problems in irrigation engineering activities and develop the abilities to plan, organize and communicate effectively,
- Learn aspects of human relations, appreciate the manual work and recognize personnel problems existing in the field
- Provide opportunity for potential employers and other stakeholders to assess our students
- Create a foundation and opportunities for employment in public and private sectors.

## **2. SCOPE OF THE FPT GUIDELINES.**

These Guidelines are intended to provide the basis for implementing the FPT for BSc Agricultural Engineering. These guidelines give detailed information on:

- The General Regulations for FPT – these regulations provide all relevant information to ensure efficient conduct of the FPT programme under CoA;
- Clarifications on the kind of reports which are expected to be produced by the students at various levels of FPT;
- Procedures to be used by both local supervisors at FPT stations and the academic supervisor from SUA in supervising, assessing and grading of the FPT performance of students.

These guidelines are therefore intended to be a resource guide for students, on-station supervisors, and academic supervisors.

### 3. PREPARATION OF FIELD PRACTICAL TRAINING

The FPT in the Department of Engineering Sciences and Technology (DEST) is conducted during the inter-session period (July – September) after the second semester for a period of 8 weeks. The Department of Engineering Sciences and Technology is solely responsible for allocating FPT places to all students. However, students may be allowed to propose FPT places or stations of their own **at least 8 weeks** before commencement of the FPT. All proposed FPT stations must be approved by the Department before commencement of the FPT. ***Training at a station not approved and not allocated by the Department before the start of FP training will not be recognized.***

### 4. PROCEDURE TO BE FOLLOWED DURING FPT

The students must read and ensure that they are conversant with the FPT Guidelines for BSc Irrigation and Water Resources Engineering degree programme (downloadable from SUA website) throughout the FPT period. Before departure for FPT, each the student will be provided with FPT Logbook, a letter of introduction to the allocated FPT station, Arrival Note form (*Appendix 1*) and 'On-Station FPT Assessment Form'(Appendix 2)

- 4.1 The "arrival" note form prepared and issued by the Department of Engineering Sciences and Technology to each student should be filled and returned to the Department by the student within the first week of FPT (see sample in Appendix 1).
- 4.2. The training officer (On-station Supervisor) will ensure that the training program is set up and shared with the FPT coordinator/SUA supervisor before the end of the first week of FPT. This program will form the basis for supervision and assessment when SUA supervisor visits the station.
- 4.3. Each student will be visited at least once during each FPT period by SUA supervisor.
- 4.4. The student is responsible for bringing the "on station assessment form" (Appendix 2) duly completed *in a sealed, confidential envelope* together with his/her report to the Department FPT Coordinator.

## 5. TRAINING LEVELS

Students at different levels of learning possess different skills and abilities and the tasks they are expected to perform during FPT should differ accordingly. Therefore each FPT session is intended to impart technical competence to students according to level of training achieved as follows:

**5.1 FPT1:** Students in their first year of study are assumed not yet to have any substantial technical knowledge in their field of specialization except in workshop training conducted over a period of 240 hours at SUA workshops within the 1<sup>st</sup> and 2<sup>nd</sup> Semesters and therefore students doing FPT1 should work in the capacity of ***Craftsman skills level*** mainly in workshops.

**5.2 FPT2:** Students in their second year of study already possess some basic knowledge in their area of study and should be given an opportunity to familiarize themselves with the requirements of professional practice. Therefore students doing FPT2 should work in the capacity of ***skilled technician level***

**5.3 FPT3:** Students in their third year of study already possess substantial technical knowledge in their area of study and should be given an opportunity to familiarize themselves with the requirements of professional practice. Therefore students doing FPT3 should work in the capacity of ***Professional Engineer level*** in the area of specialization

## 6. FIELD PRACTICAL TRAINING REPORTS

For each of the FPT sessions (FPT1, FPT 2or FPT3), each student will be provided with an FPT Logbook in which he/she will be required to record day to day FPT activities carried at the station for the whole FPT period. The Logbook has to be compiled at FPT station. For any week the Logbook should consist of the following:

- a daily record giving short description of actual work done (**Appendix 3**)
- a weekly summary of essential activities (work) performed in the week (**Appendix 4**)

The Logbooks have to be checked and signed weekly by the On-station supervisor/Training officer. Each student is required to write and submit general and technical reports which will be assessed by the SUA academic staff who supervised the student's FPT. A space for writing these reports is provided in the Logbooks (immediately after the weekly reports)

## 6.1 The Report

The report is to be compiled in accordance with the guidelines given below. It may be hand written or typed on A4 size blank sheet provided (see Appendix 3) and should be **brief and clear**. The completed report has to be signed by the student and countersigned by the On-Station supervisor of the institution/company/farm in which the student was attached before submission to the Department of Engineering Sciences and Technology for assessment. FPT reports must be submitted to the Departmental FPT coordinator **by the end of the second week of the first semester of the subsequent academic year**, otherwise one would be deemed to have failed FPT.

## 6.2 Objectives of the FPT Report

The main objectives of FPT report are to reflect on the:

- Student's understanding and appreciation of Irrigated Agriculture, water supply, and soil and water conservation engineering practices
- Student's appreciation of what might be his/her responsibilities as an irrigation engineer and of the people he/she will have to lead or co-operate with, and
- Student's ability to communicate technical information effectively.

## 6.3 Specific Guidelines for preparation of FPT reports

### 6.3.1 FPT1 Report

The report should consist of two parts:

- (i) Weekly report, which consist of the summary of tasks performed throughout the week and a description of one main job performed that week
- (ii) Final report, describing a particular technical process. The technical process may consist of a topic such as:
  - Repair and maintenance of irrigation/water supply system
  - Repair of a water pump/water storage tank

- Fault finding in electrical circuits
- Fabrication of simple parts in workshop etc.

Description of this process should consider as many engineering details as possible, such as:

- Materials and energy input required
- Tools and equipment used
- Technology of the process
- Skill requirements of the operators, etc.

The description should include various sketches and drawings, and there should be one major engineering drawing of an existing component, requiring at least three views including one in which sectioning is necessary. It should be fully dimensioned and presented on a standard A4 size sheet (Appendix 3)

### 6.3.2 FPT2 report

The report should consist of two parts:

- (i) Weekly report, which consist of the summary of tasks performed throughout the week including description of one main job
- (ii) Final report, comprising of two parts; the technical part called the “**process**”, and another part called the “**company**”

The engineering process may consist of a topic such as:

- Repair and maintenance an engineering system, e.g., irrigation water intake, water storage tank/reservoir, main irrigation canal, field irrigation canals, pipe network etc
- Installation and testing of a pumping plant, laying out pipeline system, laying out/construction of irrigation canals etc.
- Sampling of water/waste water and quality analysis
- Soil erosion measurements and analysis etc.

The company part discusses organizational and manpower aspects of the company/factory/firm or institution. Both the process and the company description may be discussed with the academic supervisor during his/her visit to the station.

### 6.3.3. FPT 3 Report

The report should consist of two parts:

- (i) Weekly report summary, including description of one main job
- (ii) Final report, comprising one major part emphasizing an engineering problem in its technical, management and cost aspects. The topic may be chosen by the student himself and discussed with the on-station supervisor and the academic supervisor from SUA during his/her visit.

Topics may be chosen such as:

- Design, development and testing of a new sprinkler system.
- Design of irrigation canal, water supply system, waste water system, water conservation systems, etc.
- Modification of an existing irrigation system
- Soil and water conservation and/or reclamation using engineering principles etc.

Emphasis should be given to the procedure of innovation, design and implementation after consideration of skills available, manpower and material requirements, utilities, sources of power, costs, etc. ***The student's contribution should preferably be of use to the company.***

## 7 SUPERVISION OF FPT

Organization of FPT supervision for BSc. Irrigation and water resources engineering students will be undertaken by the Department of Engineering Sciences and Technology. FPT reports will be marked at DEST by the academic staff who supervised the student and the results will be subject to consideration by the Board of the College of Agriculture in the 2<sup>nd</sup> Semester of the succeeding year.



The day-to-day supervision during FPT will be the responsibility of the on-station supervisor of the company/firm/site where the student is undertaking his/her FPT. The on-station supervisor should be a senior technical personnel, e.g. an irrigation engineer, a civil engineer, a site engineer, technical manager, etc.

### **7.1 Duties of the on-station supervisor**

The appointed On-station supervisors (Training Officers) are expected to ensure the smooth running of the FPT at the station and report accordingly.

The duties of the on station supervisor are to:

- Prepare a suitable training program for the students, preferably in collaboration with the Departmental FPT or supervisor from SUA **where possible**.
- Assist the student in carrying out the proposed program
- Examine and sign student's reports and logbooks once a week, and
- Fill an assessment form prepared by the Department of Engineering Sciences and Technology for each student (Appendix 2).

Since the Training Officer has other responsibilities, he/she should treat the students just like other workers who are responsible to him/her in terms of productivity, efficiency and discipline. The student is expected to work somehow independently requiring minimum supervision from the Training Officer.

## **8. REGULATIONS ON ASSESSMENT OF FPT LOG BOOKS AND REPORTS**

- 8.1 All students must report to the allocated FPT stations only. A student who fails to report to the allocated FPT station without permission from FPT coordinator shall be deemed to have failed the FPT and shall be required to undertake the FPT at his/her own time and cost during the next FPT session.
- 8.2 To avoid duplication and repeating of FPT activities, no student shall be allocated to the same station for FPT 1, 2 or 3.
- 8.3 FPT Logbooks and reports will be assessed and marked by the academic staff who supervised the student's FPT and the result will be subjected to consideration by the Department Examiners Board before submission to the College Board for approval.
- 8.4 The FPT marking/assessment shall involve the following components:

- Continuous (day to day) assessment made by the on-station supervisor during the FPT period. This shall contribute 30% of the overall assessment.
- Logbooks: Assessed by the SUA supervisor shall contribute 70% of the overall assessment (Weekly report: 15% and Final report: 55%)
- Qualitative character assessment for each student made by the on-station supervisor for the entire FPT period (see Appendix 2). A penalty shall be imposed on the final FPT score in case of bad character assessment made by the on- station supervisor. The penalty level shall be determined by the scores in part 2 of the 'on – station FPT assessment form'
- The criterion for final (overall) FPT assessment is as detailed in Table 1. The emphasis on report content is as indicated by the assessment weights, and this change according to the year of study.

8.5 Each student will be required to pass FPT1, FPT2 and FPT 3 before graduation. The FPT pass mark is 50%

8.6 A student failing FPT will be required to repeat/supplement the FPT at his/her own cost.

8.7 A student not completing a full 8 weeks FPT without compelling reasons shall be deemed to have absconded from that FPT and shall as a result be discontinued from studies.

8.8 A student failing to complete FPT with compelling reasons shall be required to request for postponement of the remaining FPT component, and if allowed shall complete the remaining part of the FPT during the vacation or when next offered at his/her own cost.

8.9 A student allowed to postpone FPT shall be required to undertake the FPT during the vacation or when next offered at his/her own cost.

8.10 A student who fails after doing FPT as a third attempt shall be required to retake the FPT and if he/she fail for the fourth time shall be discontinued from studies.

8.11 A student who will be reported to have performed any gross misconduct during FPT period shall be reported to the University Management and such case will be dealt with according to the SUA Students' by-laws.

**Table 1: Criteria for final report assessment**

<b>Final Report</b>	<b>FPT 1</b>	<b>FPT 2</b>	<b>FPT 3</b>
<b>Report Content:</b>			
• Description and analysis	10	10	5
• Problem identification, definition, and major assumptions	-	-	10
• Discussion and comparison of alternative solution	-	-	7
• Choice and justification of most appropriate solution	-	-	10
• Correctness of engineering drawings, charts, diagrams, etc.	10	10	5
• Summary and conclusions	10	5	5
• Recommendations for implementation	-	10	7
<b>Report arrangement:</b>			
• Completeness of report and drawings	10	8	2
• Neatness of report and drawings	10	7	2
• Adherence of report to guidelines	5	5	2
Subtotal (Final report)	55	55	55
Continuous assessment during FPT by the on-station supervisor	30	30	30
Weekly report assessment by Academic supervisor	15	15	15
<b>TOTAL FPT MARKS</b>	100	100	100
<b>Penalty for Character assessment (maximum 20 marks)</b>			
<b>GRAND TOTAL SCORE</b>			

Remarks by SUA Examiner .....

.....

**APPENDIX 1**  
**FPT STATION ARRIVAL NOTE**

**PART A (To be filled by student)**

Name of student.....  
Year of study..... FPT No.....  
I declare that I have started working with  
Company/organization .....  
Address: P.O. Box .....  
E-mail.....  
Location.....  
Tel. No.....  
Date of starting FPT .....  
Student's mobile phone No.....  
Student's email address.....  
Signature of student.....Date:.....

**PART B (To be filled by On-Station Supervisor)**

Name of On-Station Training Supervisor.....  
Position .....  
(e.g. Workshop manager, Production Manager, Quality Assurance Manager, Institute Director, etc.)  
Mobile phone.....  
Email address.....  
On-Station Supervisor's signature and stamp..... Date.....

This form has to be sent by the student (through post or E mail) immediately after arrival to:  
FPT – Coordinator  
Sokoine University of Agriculture  
Dept. of Engineering Sciences and Technology  
P.O Box 3003, SUA Morogoro  
E mail: [.lazaroel@ssuanet.ac.tz](mailto:.lazaroel@ssuanet.ac.tz) or [lazaroel@yahoo.com](mailto:lazaroel@yahoo.com)

**Appendix 2**

**PART 1: ON STATION FPT ASSESSMENT FORM** (To be filled by the on-station supervisor)

This is to certify that Mr. /Ms. ....( Name of student)

has completed a period of practical training with our factory/institution/firm from

..... to .....(Dates)

Name of the institution/firm .....

The trainee has worked at Craftsman/Technician/Engineer level.....

The duties assigned to the trainee were .....

.....

Name of On-Station Supervisor .....Position .....

**PART1: PRACTICAL/WORKING SKILLS**

Please assign a grade between 0 and 6 to each one of the items 1 to 5 below according to the following grading scale:

- 5.1 – 6.0: Excellent
- 4.1 – 5.0: Very good
- 3.1 – 4.0: Good
- 2.1 – 3.0: Satisfactory
- < 2.1: Fail

1. Place the grade in dotted lines for each item.
  - i) Skills obtained .....
  - ii) Attitude to work .....
  - iii) Initiative and Independence .....
  - iv) Reliability .....
  - v) Adherence to working time .....
2. Number of days the trainee was absent from work.....
3. Reasons for absence.....
4. Was the logbook submitted to you weekly for your comments and signature? (Yes/No).....
6. Was there any misconduct during FPT (e.g. Lack of respect to supervisors, fighting, destruction of property, taking alcohol, stealing etc.) Yes/No If yes explain  
.....  
.....

**PART 2: CHARACTER & SKILLS ASSESSMENT (Please tick whichever is applicable)**

S/N	Character/skills assessed	Outstanding	above average	Average	Below average	Poor
1.	Ability to work in a team					
2.	Trustworthiness and Reliability					
3.	Adherence to Work ethics					
4.	Ability to lead, motivate and resolve conflicts					
5.	Ability to provide quality services without need for any inducements					

**REMARKS** .....

.....

.....

On-station supervisor's name .....

Position .....

Signature and official rubber stamp.....

Date and Place .....

**Appendix 3: A sample of Logbook Daily Record**

Weekly Report No. .... from ..... to .....20.....

Page1:

Day of week	Brief description of work performed	Hours
<b>Monday</b>		
<b>Tuesday</b>		
<b>Wednesday</b>		
<b>Thursday</b>		
<b>Friday</b>		
<b>Saturday</b>		

.....

**Training Officer**

.....

**Date**





**Appendix 4: A sample of a blank sheet**

**Page 1**

Practical Training year: 20.....		PT (1, 2, 3)	Report	Week No	
				Page No	
Drawing No	Date		Checked by	Date	
Drawing Name			Training Officer	Name	

Practical Training year: 20.....		PT (1, 2, 3)	Report	Week No	
				Page No	
Drawing No	Date		Checked by	Date	
Name of drawing			Training Officer	Name	