

**Practical Manual**  
**B. Sc. Agriculture**  
**Processing Technology of Legumes and Oilseeds**  
**Course No.: ASFE3102**  
**Credit: 3(1+2)**  
**Semester: 6<sup>th</sup>**



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*Shaping Lives...  
Empowering Communities...*

**Department of Agricultural Engineering**  
**M.S. Swaminathan School of Agriculture**  
**Centurion University of Technology and Management, Paralakhemundi**  
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**June, 2019**

**Practical Manual**  
**B. Sc. Agriculture**  
**Processing Technology of Legumes and Oilseeds**  
**Course No.: ASFE3102 Credit: 3(2+1) Semester: 5<sup>th</sup>**



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Paralakhemundi**

*Certificate*

*Certified that this is a bonafide record of practical work done by*

*Mr./Ms. \_\_\_\_\_*

*Regd. No. \_\_\_\_\_ in B. Sc. (Hons.) Agriculture degree programme,  
Course No. ASFE3102 entitled "Processing Technology of legumes and oilseeds  
" during 5<sup>th</sup> semester of the academic year 2019-20.*

**Date:**

**Faculty In charge**

**Evaluation System**  
**Renewable Energy & Green Technology**  
**Course No.: ASAE2203**

<b>Sl. No.</b>	<b>Marks distribution*</b>	<b>Total marks</b>	<b>Marks obtained</b>
<b>1</b>	<b>Observation ,Calculation</b>	<b>3</b>	
<b>2</b>	<b>Application &amp; Inference</b>	<b>2</b>	
<b>3</b>	<b>Viva</b>	<b>5</b>	
	<b>Total</b>	<b>10</b>	

**\*NB: Marks distribution will vary department wise**

**Signature of Faculty In-charge**

## List of Experiments

Experiment No.	Title	Page No.	Signature	Remark
1	Determination of moisture content of legumes and oilseeds.			
2	Determination of size of legumes and oilseeds.			
3	Determination of bulk density, true density and specific gravity of legumes and oilseeds.			
4	Determination of angle of repose of legumes and oilseeds.			
5	Determination of geometric mean diameter and sphericity of legumes and oilseeds.			
6	Study of mini dal mill			
7	Study of mini oil mill			
8	Study of preconditioning of pulses before milling			
9	Removal of anti-nutritional compounds from selected pulses and oilseeds.			
10	Study about different refining process of oils			
11	Study of cooking quality of pigeon pea			
12	Study of cooking quality of chickpea			
13	Preparation of value added products of legumes			
14	Visit to commercial dal mill and oil mill			

## **Aim of the Experiment**

Determination of moisture content of legumes and oilseeds.

## **Requisites**

## **Theory**

## **FORMULA**

## **PROCEDURE**

- **TABULATION**

SL. NO.	SAMPLE	W <sub>w</sub> (g)	W <sub>i</sub> (g)	MC <sub>wb</sub> (%)	MC <sub>db</sub> (%)
1.					
2.					
3.					
4.					

- **CONCLUSION**

**Signature of student**

**Signature of faculty**

**Marks allocated**

## **Aim of the Experiment**

Determination of size of legumes and oilseeds.

## **REQUISITES**

## **THEORY**

## **PROCEDURE**

## **TABULATION**

SL NO.	SAMPLE	LENGTH(mm)	BREADTH(mm)	THICKNESS (mm)

## **Conclusion**

**Signature of student**  
**Marks allocated**

**Signature of faculty**

## **Aim of the experiment**

Determination of bulk density ,true density and specific gravity of legumes and oilseeds.

## **Requisites**

## **Theory**

## **Procedure**

**Tabulation 1: BULK DENSITY**

SL NO.	SAMPLE	V <sub>1</sub>	<u>W</u> <sub>1</sub>	B.D	POROSITY

V1=

W1=

B.D

**Tabulation 2: True density and Specific gravity**

<b>SL NO.</b>	<b>SAMPLE</b>	<b>Ws</b>	<b>Vt</b>	<b>T.D</b>	<b>S.G</b>

**Ws=**

**Vt=**

**T.D=**

**S.G=**

**CONCLUSION**

**Signature of student**

**Signature of faculty**

**Marks allocated**

**Aim of the experiment**

Determination of angle of repose of legumes and oilseeds.

**Apparatus required;****Theory:****Procedure**

**Tabulation:**

<b>SL NO.</b>	<b>SAMPLE</b>	<b>H(cm)</b>	<b>D(cm)</b>	<b>ANGLE OF REPOSE(<math>\theta</math>)</b>

**H=**

**D=**

**CONCLUSION:**

**Signature of student**

**signature of faculty**

**Marks allocated**

## **Aim of the experiment**

Determination of geometric mean diameter and sphericity of legumes and oilseeds.

## **REQUISITES**

## **THEORY**

## **Procedure**

**Tabulation**

<b>SL NO.</b>	<b>SAMPLE</b>	<b>a(mm)</b>	<b>b(mm)</b>	<b>C(mm)</b>	<b>GMD</b>	<b>SPHERICITY</b>

**a=**

**b=**

**c=**

**CONCLUSION:**

**Signature of student**

**Signature of faculty**

**Marks allocated:**

## **Aim of the experiment**

Study of mini dal mill

## **Theory**

Dal mill is a machine to obtain dehusked polished split dal.

It consists of set of operation.

All the operation are performed in a sequence at one go in a mini dal mill.

The operation performed are

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

## **CLEANING AND GRADING**

## **DEHUSKING**

## **Oil/water applications**



**Fig: MINI DAL MILL**

**DRYING**

**SPLITTING**

**GRADING**

**Students observation and learning outcome**

**Signature of student**

**Signature of faculty**

**Marks allocated**

## **Aim of the experiment**

Study of mini oil mill

## **Theory**

Oil extraction from oilseeds is termed as oil milling.

It is done by following steps:

1. Seed cleaning
2. Decortication
3. Size reduction
4. Crushing
5. Conditioning
6. Refining

### **SEED CLEANING**

### **DECORTICATION**

### **SIZE REDUCTION**

### **CRUSHING**

**CONDITIONING**

**REFINING**

**Students observation and learning**

**Signature of student**

**Signature of faculty**

**Marks Allocated:**

**Aim of the experiment**

Study of pre-conditioning of pulses before milling.

**Theory:****Students observation and learning****Signature of student****Marks Allocated:****Signature of faculty**

**Aim of the experiment**

Removal of anti-nutritional compounds

**Theory****Method to remove anti-nutritional compounds****Student's observation & learning outcome****Signature of student****Signature of Faculty****Marks Allocated:**

## **Aim of the experiment**

Study of different refining process of oils

## **Theory**

### **Methods of refining of oil**

#### **1. Degumming:**

#### **2. Neutralization**

### **3. Bleaching**

### **4. Filtration**

### **5. Deodorization**

**Student's observation & learning outcome**

**Signature of student**

**signature of faculty**

**Marks allocated:**

## **Aim of the experiment**

Study of cooking quality of pigeon pea

## **Requisites**

## **Theory**

## **Procedure**

**Tabulation**

<b>SL NO.</b>	<b>SAMPLE</b>	<b>COOKING TIME</b>	<b>WATER ABSORPTION</b>	<b>VOLUME EXPANSION</b>	<b>SOLID LOSS</b>

**Student's observation & learning outcome**

**Conclusion**

**Signature of student**

**Signature of faculty**

**Marks Allocated**

## **Aim of the experiment**

Study of cooking quality of chickpea

## **Requisites**

## **Theory**

## **Procedure**

**Tabulation**

<b>SL NO.</b>	<b>SAMPLE</b>	<b>COOKING TIME</b>	<b>WATER ABSORPTION</b>	<b>VOLUME EXPANSION</b>	<b>SOLID LOSS</b>

**Student's observation & learning outcome**

**Conclusion**

**Signature of student**

**Signature of faculty**

**Marks Allocated**

## **Aim of the experiment**

Preparation of value added products of legumes





## **Aim of the experiment**

Visit to commercial dal mill and oil mill



