xxiii. Food grain godown and warehouse management

xxiv. Post-harvest value chain management including logistics

After two to three days common orientation on different skill enhancement modules, students will take up either two or more modules (maximum four modules recommended) as per the local needs and gain complete hands-on experience on these skill areas. The selection of the module(s) will be entirely on the student's choice.

Indicative details of the skill enhancement modules are given at the end of this section. The credit hours for each module have been kept as 0+4. However, the institution is at liberty to modify the credit hours/ contents for the skill enhancement modules depending on the level of skill to be imparted to the students. For example, if a student wishes to take up three or four skill modules, the contents and credits can be modified for those skill modules, making the total 8 credits However, in no case, more than four modules are recommended for offering to a student.

It is emphasized that the purpose is to impart practical knowledge/ skill for operating the system and none of the course should be taken in theoretical mode. In specific cases, the skill enhancement in the specific area can be further continued during the 10 weeks' internship in case of exits for UG-certificate and UG-Diploma for further strengthening of the skill.

The above modules and details are indicative only and the institutions have the liberty to formulate new modules and modify the content of the modules relevant to the respective regions or even modify the titles of the above modules. It is advised that the institutions should define the detailed breakup of the skill areas depending on the facilities/ expertise available.

The course can also be offered in partnership with capable organizations/ companies/ NGOs/ progressive entrepreneurs. In such cases, a detailed content should be prepared in consultation with the industry/ organization and the institution should have a regular monitoring for the learning process. The evaluation can be done jointly by the institute and collaborating partners. The timetable for the remaining part of the semester will be adjusted accordingly as mentioned earlier.

Engineering Drawing 2 (0+2)

Objective

To enable the students to draw engineering drawings for some simple machines/ equipment

Practical

Introduction to engineering drawing, practice of different layout drawings; Drawing instruments and their use; Introduction to lines, letterings, single stroke letters and gothic letters; Dimensioning, dimension line, extension line, arrow head, continuous and progressive dimensioning; Introduction of drawing scales, representative fraction; Practice on orthographic projections, references planes, points and lines in space; Drawing for orthographic projection of points by first angle projection method; Third angle methods of projection; Projection of planes; Projections of solids: polyhedra, cylinder, cone; Projections of solids: prisms and pyramids; Development of surfaces of geometrical solids; Drawing the section of solids: cylinder, cone and sphere; Introduction to isometric scale, isometric view and isometric drawing; Isometric projection of geometrical solids; Preparation of working drawing from models and isometric views; Sectional drawing of simple machine parts; Nomenclature, thread profiles, multi start threads, left and right hand threads; Conventional

representation of threads; Forms of screw threads like metric thread, whit worth thread; Square thread: acme thread, knuckle thread, buttress thread; Square headed and hexagonal nuts and bolts; Different types of lock nuts, studs, machine screws, cap screws and wood screws; Processes for producing leak proof joints; Drawing of different types of rivet heads and riveted joints and foundation bolts; Drawing of stud screws, set screws, butt, hexagonal and square; Drawing of keys: taper, rank taper, hollow saddle etc.; Symbols for different types of welded joints

Suggested Readings

1. Bhatt, N. D. 2010. Elementary Engineering Drawing. Charotar Publishing House Pvt. Ltd., Anand.
2. Bhatt, N. D. and Panchal, V. M. 2013. Machine Drawing. Charotar Publishing House Pvt. Ltd., Anand.
3. Narayana, K. L. and Kannaiah, P. 2010. Machine Drawing. Scitech Publications (India) Pvt. Ltd, Chennai.

Computer Programming and Data Structures 2 (0+2)

Objective

To make the students conversant on computer programming languages, specifically C language as well as to make him familiar with programming for simple agricultural engineering applications

Practical

Introduction to high level languages; Structure programming, C programming, a simple C programming, execution of a C program, program and instruction; Familiarizing with Turbo C IDE; Building an executable version of C program; Study of different operators such as arithmetic, relational, logical, assignment, increment and decrement, conditional, bitwise and special operators, precedence of arithmetic operators; Debugging a C program; Developing and executing simple programs; Creating programs using decision making statements such as if, go to and switch; Developing program using loop statements while, do and for; Using nested control structures; Familiarizing with one and two dimensional arrays; Using string functions; Creating user defined functions; Developing structures and union; Using local, global and external variables; Using pointers; Developing linked lists in C language; Inserting an item in Linked List; Deleting an item in Linked List; Implementing Stacks; Implementing push/pop functions; Creating queues, Insertion/ Deletion in queues.

Suggested Readings

1. Augenstein, L. and Tanenbaum. 2003. Data structures using C and C++. PHI/Pearson Education.
2. Balagurusamy, E. 1990. Programming in 'C'. Tata McGraw Hill Publishing Co. Ltd., 12/4 Asaf Ali Road, New Delhi.
3. Bronson, G. and Menconi, S. 1995. A First Book of 'C' Fundamentals of 'C' Programming. Jaico Publishing House, New Delhi.
4. Drozdek, A. 2012. Data Structures and Algorithms in C++. Vikas Publishing House / Thomson International Student Edition.