**2.2.3. Quality of Experiments (15)**

**A. Experimental methodologies (05)**

Maharashtra State Board of Technical Education, (MSBTE) Mumbai, is autonomous body of state of Maharashtra. MSBTE has designed laboratory manuals for most of the subject in curriculum. The “I” Scheme laboratory manuals are designed so that practical of subject should focus on outcomes. These manuals are designed to help all stakeholders, especially students, teachers and instructors to develop pre-determined outcomes in the students. Generally, Experiments are conducted in group of 3 to 4 students. For practical purpose, batch size of 20 students in a batch is considered. While performing experiments, special focus is given so that skills in cognitive domain, psychomotor domain and affective domain are developed in students. As experiments are designed by MBSTE, For each practical, following (for subject named – Data Structure using ‘C’ ) stages/steps is mentioned in laboratory manual.

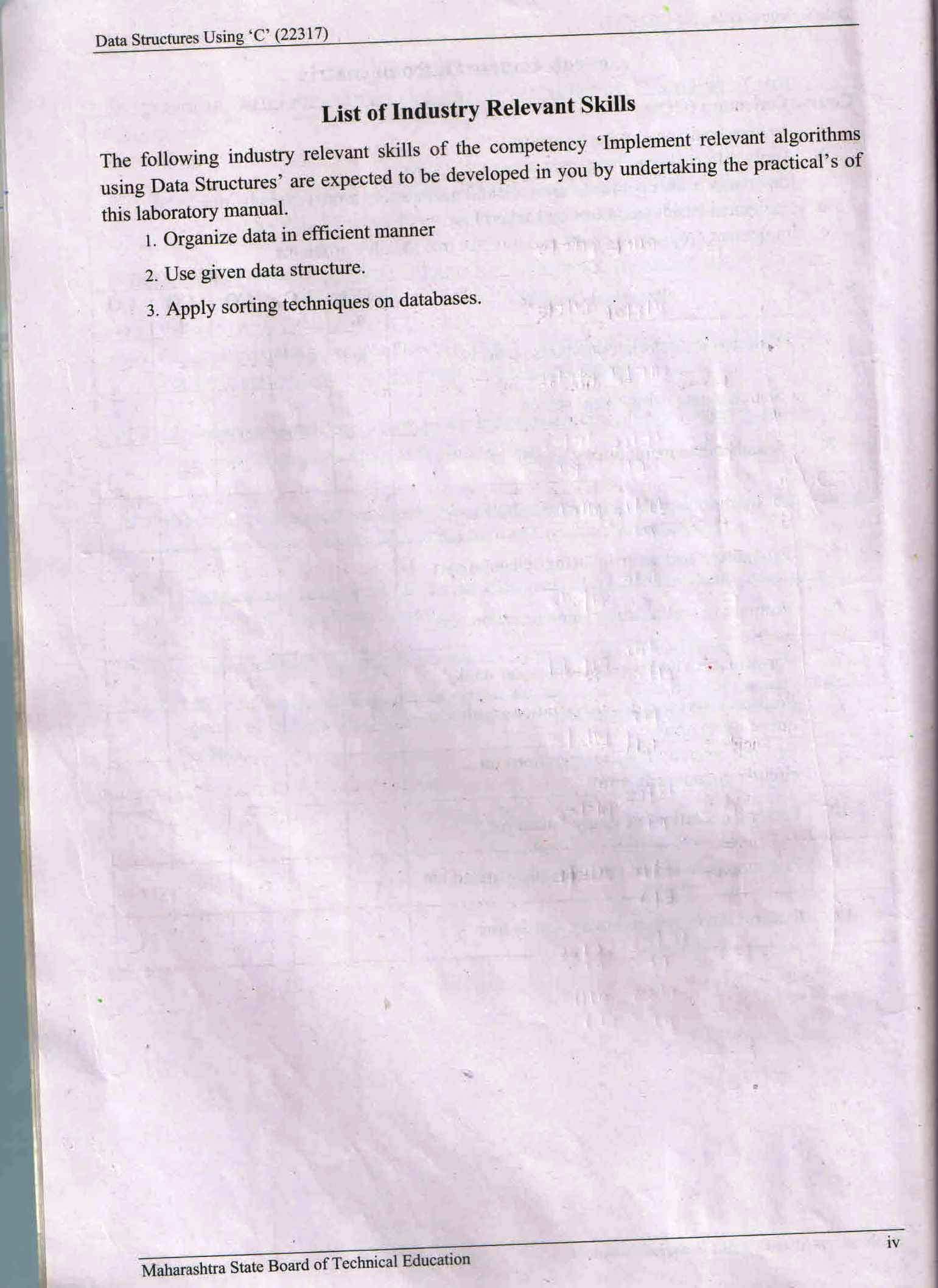
* Practical Significance
* Relevant Program Outcomes
* Competency and Practical skills
* Relevant Course Outcome(s)
* Practical Outcomes(PrOs)
* Relevant Affective domain related Outcomes
* Minimum Theoretical Background
* Algorithm
* Flowchart
* Program Code
* Resources Required
* Precautions
* Resources Used
* Result (Output of Program)
* Conclusion
* Practical related questions
* Exercise
* References/Suggestions for further reading
* Assessment Scheme

Above steps help teachers as well as students to focus on competencies for achieving outcomes. The Images on next page shows above list of stages given by MBSTE Laboratory Manual.

|  |  |
| --- | --- |
| First Page.jpg | 9.jpg |
| 10.jpg | 11.jpg |
| 12.jpg | 13.jpg |
| 15.jpg | |

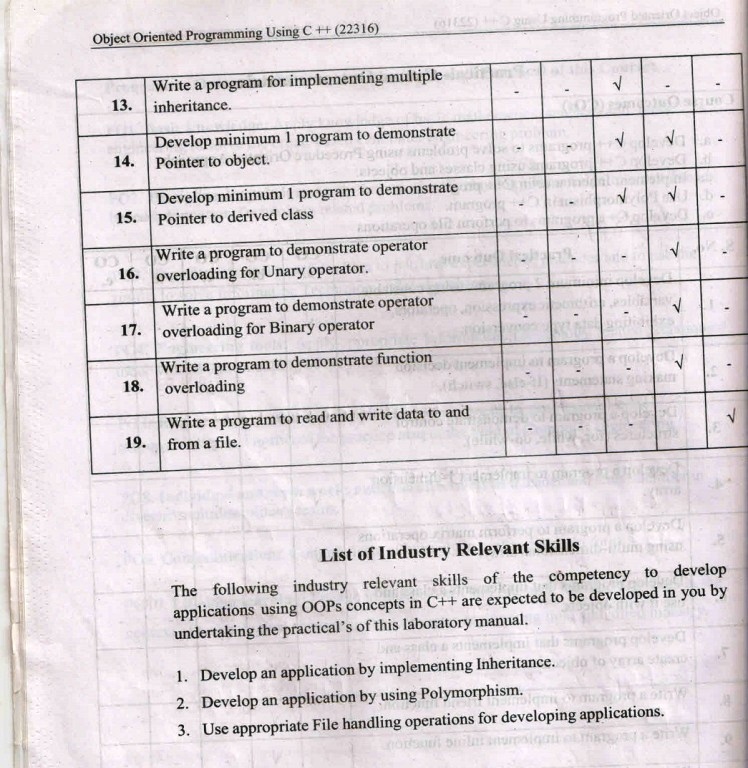
**B. Innovative experiments including industry attached practices, virtual labs (05)**

The laboratory manuals of subject also contain List of industry relevant skills. Following image shows Laboratory manual page of subject “Data Structures using C”



Picture: Laboratory manual page of “Data Structures using C” showing list of industry relevant skills

Computer engineering program have many subjects which are programming oriented. These programming subjects are practical oriented and these require programming (coding) standards to be followed. Programming standards like Indentation rules, Proper comments in code, Naming conventions for local variables, global variables, constants and functions etc are industry attached best practices that students do follow. The image on next page shows list of industry relevant skills of “Object Oriented Programming Using C++”. These industry relevant skills are given by MSBTE in respective subject laboratory manual.



**C. Relevance to outcomes (05)**

As the laboratory manuals are designed by MSBTE, all experiments are mapped to outcomes of particular course. The Picture on next page shows Course outcome matrix. Here, for the subject, ‘**Data Structures using C’** All COs are listed as a,b…e and all practical’s are mapped to these COs.

