

17. Identify basic programming concepts.
18. Define the main steps involved in building and executing programs.
19. Describe the basic data structures: arrays, records, and linked lists.
20. Identify the applications of the basic data structures.

**Practical Activity**

Practical sessions are generally intended to support and extend the lecture material in one or both of the following ways depending on availability of resources:

1. Programming lab including an open book lab final exam (usually in the last week of the semester).
2. Tutorial sessions for homework problems.

**Programming Lab Objectives**

1. Provide practical exposure to following fundamental high-level programming concepts: constants, variables, data types, expressions, assignments, arrays, functions, and algorithmic constructs (sequence, decision and iteration).
2. Acquire basic program production skills (edit, compile, debug, trace).
3. Familiarize with the basics of a modern IDE.
4. Apply material from chapters 8,9,11.

**Programming Lab Critical Learning Outcomes**

Depending on availability of lab resources:

1. Use a modern programming environment to edit, compile, and run a small high-level program.
2. Use the programming environment to debug a high-level program.
3. Hand-trace a small high-level program.
4. Examine the following algorithms: bubble, insertion, and selection sorts, linear and binary searches.