The following definitions are adopted in the present work.

**Numerical control**: The use of numerical data for the control of operations such as complex machining. The numerical data is generated through a computer and is fed to the machine by a tape medium (conventional NC and CNC) or directly by computer (CNC or DNC).

**Computer Numerical Control (CNC)**: Numerical control wherein a dedicated computer is used to store and to perform some or all of the basic numerical-control instructions. The dedicated computer also enables the local input of data.

**Adaptive control**: Control of process that responds to changes in the manufacturing operating conditions.

**BREP**: Boundary representation of a part. The description of a solid by enumerating all faces, edges, and vertices, in both geometry and topology.

**CSG**: Constructive solid geometry. The description of solid as a tree structure of primitive volumes and the Boolean operations for combining the volumes.

**Database**: A collection of data stored in a computer medium.

**Data structure**: A scheme for organizing data in a computer database.

**Form feature**: A set of faces or other geometric entities that together form a pattern useful in part analysis; e.g., a set of faces and edges defining a hole implies a drilling process.

**Set-up planning**: It is the process of grouping of operations that can be performed in a given tool approach direction.

**Critical feature**: The feature that has tolerance constraints and requires special attention while machining.

**Feature reference**: The relation between the given features. In the present work, the user has to input this information that can be used for set-up planning, operation sequencing etc.

**Machining allowance**: The minimum stock to be removed from the work piece for getting a particular tolerance. For example, prior to grinding a plain surface, first rough milling, semi-finish milling and finish-milling operations are to be carried out. To
perform these operations a minimum amount of stock is required. This is called machining allowance.

**Machining routing:** This is the method of directing the given feature through different stages that lead to the desired shape and tolerance.

**Operation planning:** It is the method of deciding the required operations, machines, tools and cutting parameters for a given feature.

**IT grade:** It indicates the accuracy of a manufacturing process that can be achieved using the particular process/machine.

**Structure chart:** It is a word used in the present work to represent inter-linking of operations, machines, tools, and set-up plans during process plan generation.

**Fixurability:** The easy with which a feature can be held against the cutting forces.

**Process rules:** These are the rules, which dictate the method of machining a given feature. E.g. Prior to tapping hole, drilling operation is to be performed.

**Operation sequencing:** This is the method of performing the different operations of a given feature/component in particular order that gives the desired tolerance at the lowest cost.

**Process plan:** The plan used to process a part from raw material to finished goods. Usually this is a sequence of operations involving various machine tools, cutter geometries, and cutting parameters to achieve the desired dimensions.

**Computer Aided Planning (CAP):** The planning of all production activities with the use of data processing systems such as planning and decision-help software. The production activities pertain to volume, kind, timing, method, place, facility, and personnel.

**Computer Aided Process Planning (CAPP):** All planning activities in which data processing systems are used for preparation of the basic data about production processes such as machining.

**Computer Aided Design (CAD):** is the creation and optimisation of the design itself using the computer as a productivity tool.

**Computer Aided Manufacturing (CAM):** Manufacturing in which the production process is directed and controlled by data processing systems.
Computer Integrated Manufacturing (CIM): A management philosophy in which the functions of design and manufacturing are rationalised and coordinated using computer, communication, and information technologies.

Expert systems: It is a branch of artificial intelligence designed to emulate human expertise with software.

User interfaces are the means of communicating with the computer.

Normalisation: Normalisation is a process of decomposition of relation without any loss while preserving the dependency. The normalisation of the database allows the user to store information with eliminating all possible redundancy, yet it allows the user to retrieve information easily. Further, the normalisation helps database design to make its logical design exact and optimal.

Group Technology: It is a method of assignment of a code to a part that summarizes the pertinent part characteristics.

Cut Data Reference: It is the relation between cutting tool details and cutting parameters, is used for cutting tool and parameters selection.

Manufacturability: An evaluation of whether a product can be manufactured.

Rotational part: A part that can be made by rotating the workpiece. It is symmetrical along one axis, such as gear, shaft etc.

Prismatic part: A part that cannot be made by rotating. It need not be symmetrical about an axis, such as computer mouse, gas turbine blade etc.

Initial Graphics Exchange Specification (IGES): A standard sequential file format for interchanging product definition data (wire frame edge-vertex geometry, annotations, and structure) among CAD systems.

Product Data Exchange Specification (PDES): A project initiated by the IGES organisation to develop specifications that will facilitate transferring a complete product model with sufficient information so as to be interpretable by advanced CAD/CAM applications, such as process planning, tool path generation etc. The product model includes data relative to the entire life cycle of a product, encompassing design to field support.

Product Definition Data Interface (PDDI): A project funded by the U.S. Air Force to define and demonstrate a prototype system that replaces the engineering drawing as the interface between design and all manufacturing functions, including process
planning, numerical control programming, quality assurance, tool design, and production planning and control. This concept is based on a neutral file exchange format that can be used to translate data between dissimilar CAD and CAM systems.

**Standard for Transfer and Exchange of Product Model Data (STEP):** A worldwide standard being defined by the International Standards Organisation (ISO) to capture the information comprising a computerised product model in a neutral format that can be used throughout the life cycle of the product.

**Tolerance chart:** A procedure for calculating the dimensions and associated tolerances that must be maintained for each cut so that the finished part will satisfy blueprint specifications.

**Generative process planning:** A process planning system, including a database and logic that will automatically generate a process plan from graphical and textual engineering specifications of the part.

**Variant process planning:** Computer aided process planning involving a library of standard process plans; interactive editing programs; and storage, retrieval, and documentation capabilities. The plan for a new part is created by retrieving and modifying the standard process plan for a given part family.

**Tool approach direction (TAD):** Direction of cutting tool approach to machine a feature which does not interfere with fixture or any other machining feature.

**High speed machining:** It is an advanced machining process where material is removed at high speed.

**EDM wire-cut:** EDM wire-cut is a material removal process where material removal is largely because of the melting of metal due to the heat generated by electrical spark produced between wire and work piece.

**EBW process:** It is a welding process where metals are welded due to high heat generated by impinging of electrons on the metal joints. No filler is required in it.