Course Code: MEE- S406T Breakup: 3 – 0 – 0 – 3

Course Name: COMPUTER AIDED DESIGN

Course Details:

Introduction, Computer Graphics,Curve represantation,Interpolation vs approximation, Spline curve,Bezier curves and its properties,Brief mention of other curves.3-D Graphics,Solid modelling-sweep represantion wire mesh , constructive solid geometry and boolean operations, boundry represantion ,colors.

Computer aided design of machine elements such as shaft,springs,bearings and problem from other systems such as heat exchanger, inventory control etc. Writing computer programe in C ,Auto Cad and its uses.

Introduction to numerical method and optimization technique,curve fitti ng ,least square method. Newton – Raphson method forv root finding and for optimisation.Brief Introduction to numerical differtiation and integration.Linear programing for constrained optimisation (only graphical method).

Introduction to finite element method, one and two dimensional beam element (spring system) analysis.

TEXT BOOKS :- Computer graphics by Hearn & Baker,Prentice Hall

CAD/CAM by groover

Let us C by Yashwant Kanetkar and also on C++

Computer Aided analysis & design of machine elements by Rao & Dukhipati

Numerical Methods using C by Xavier Optimisation-SS Rao FEM – SS Rao

Course Code: MEE- S406P Breakup: 0 – 0 – 3 – 2 Course Name: COMPUTER AIDED DESIGN LAB

Course Details:

1. Line drawing or circle drawing experiment.
2. Geometric transformation algorithm experiment for translation.
3. Design of machine component or other system experiment.
4. Understanding and use of any 3-D Modelling Software commands.
5. Pro/E/Idea etc experiment.
6. Writing a small program for FEM for 2 spring system.
7. Root findings or curve fitting experiment.
8. Numerical differentiation or numerical integration experiment.

Computer-Aided Design (CAD)

- Use of computer systems to assist in the creation, modification, analysis, and optimization of a design.

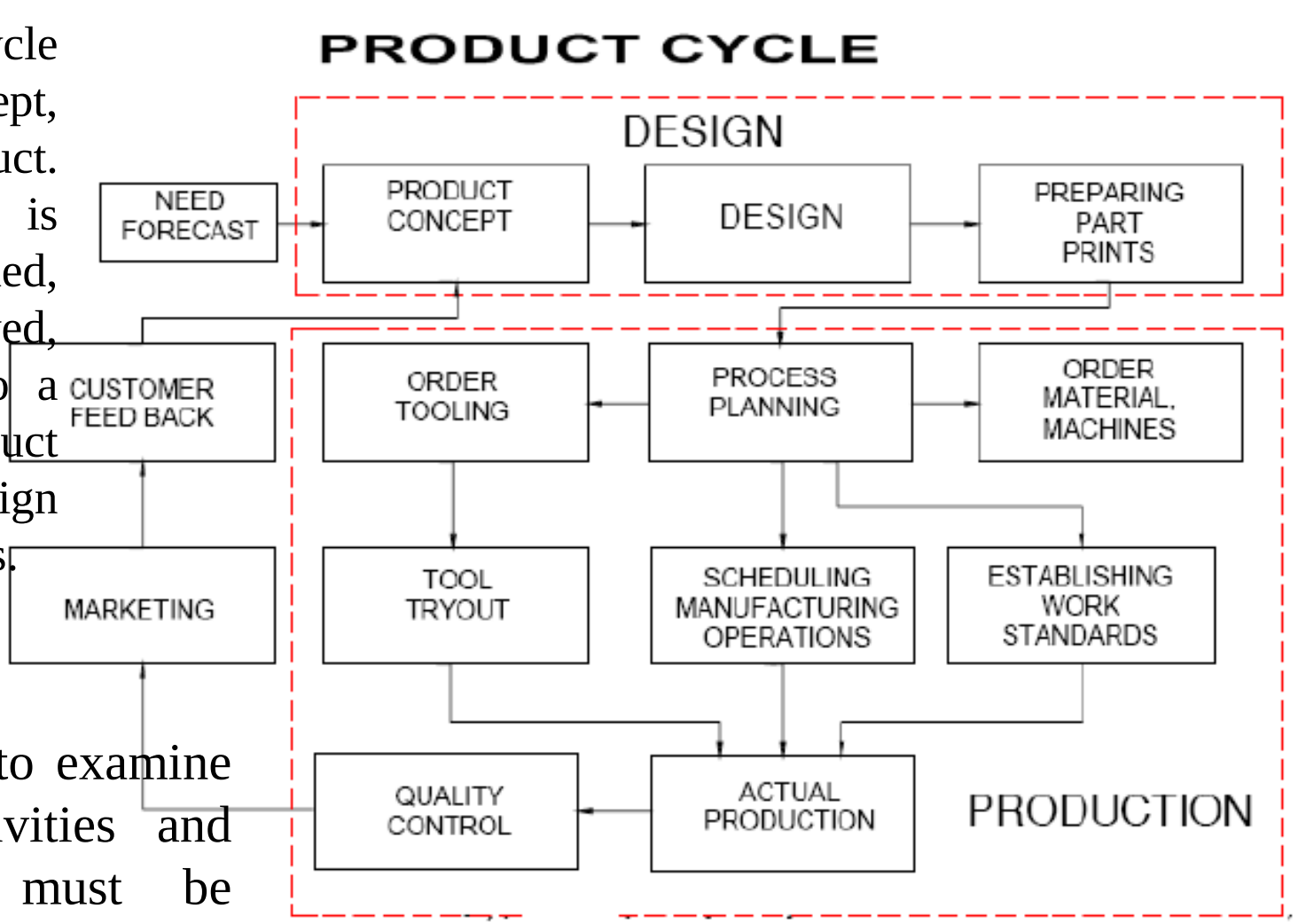
The computer systems consist of the hardware and software to perform the specialized design functions required by the particular user.

The CAD hardware- the computer, one or more graphics display terminals, keyboards, and other peripheral equipment.

The CAD software- consists of the computer programs to implement computer graphics on the system plus application programs to facilitate the engineering functions of the user.

Examples of these application programs include stress-strain analysis of components, dynamic response of mechanisms, heat-transfer calculations, and numerical control part programming. The collection of application programs will vary from one user firm to the next because their product lines, manufacturing processes, and customer markets are different. These factors give rise to differences in CAD system requirements.

the product cycle begins with a concept, an idea for a product. This concept is cultivated, refined, analyzed, improved, and translated into a plan for the product through the design engineering process.

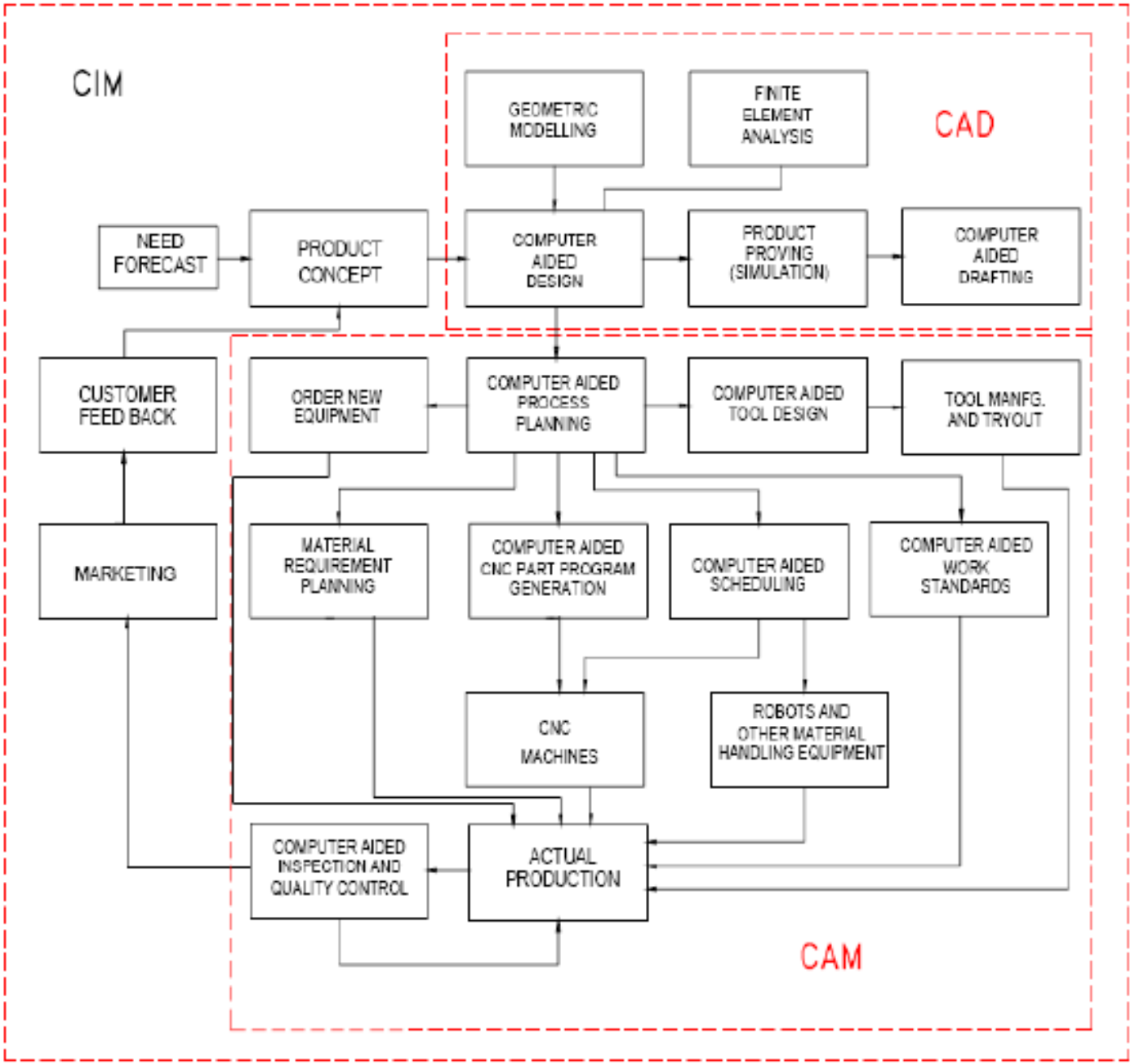


PRODUCT CYCLE IN CONVENTIONAL ENVIRONMENT

it is appropriate to examine the various activities and functions that must be accomplished in the design and manufacture of a product. We will refer to these activities and functions as the product cycle.

The cycle is driven by customers and markets which demand the product.

Product cycle is the process of managing the entire lifecycle of a product from starting, through design and manufacture, to repair and removal of manufactured products.



PRODUCT CYCLE IN AN COMPUTERISED ENVIRONMENT

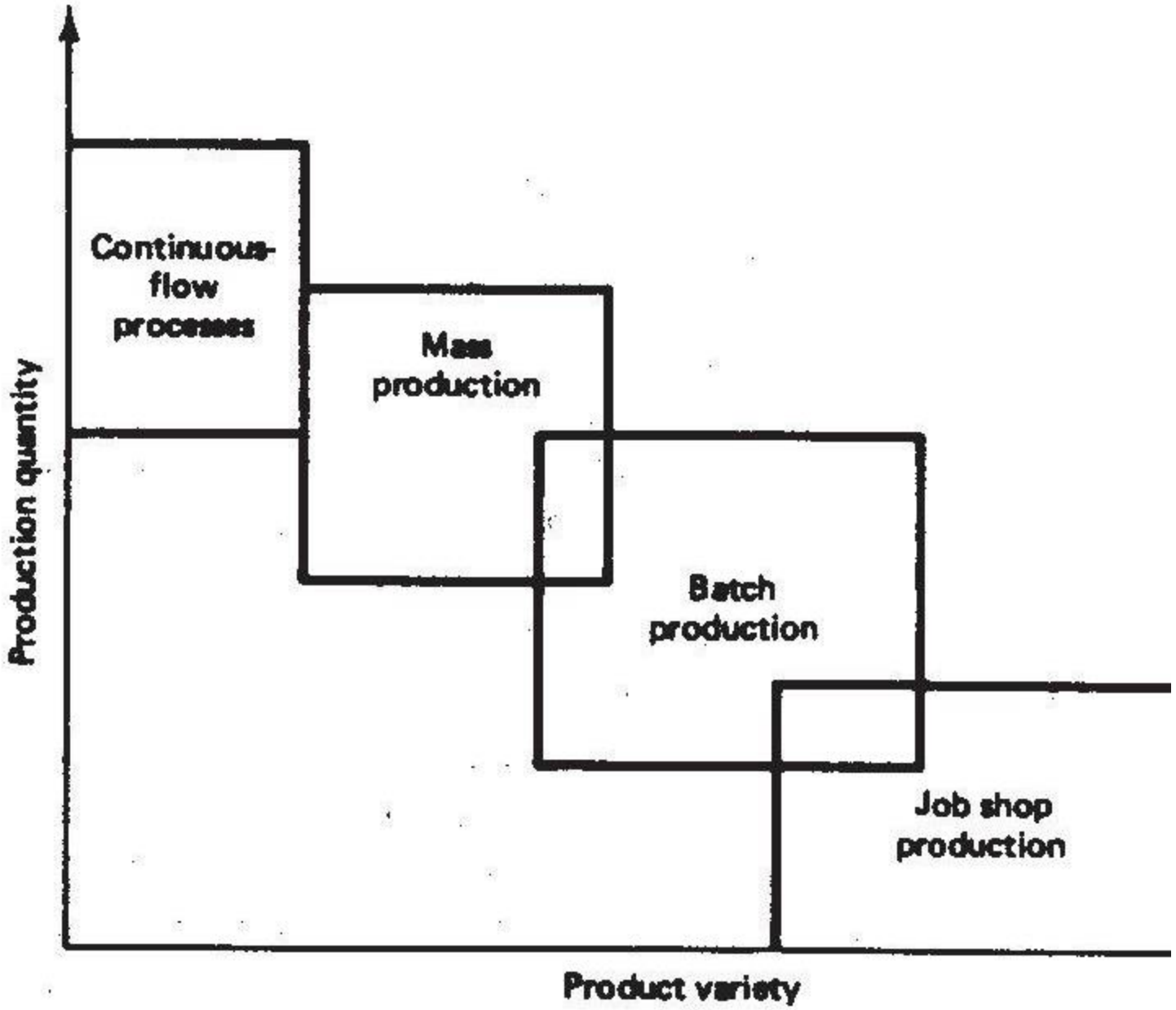
There are differences in the way the product cycle is implemented for different firms involved in production. Production activity can be divided into four main categories:

l. Continuous-flow processes-Continuous dedicated production of large amounts of bulk product. Examples include continuous chemical plants and oil refineries

2. Mass production of discrete products -Dedicated production of large quantities of one product (with perhaps limited model variations). Examples include automobiles, appliances, and engine blocks.

3. Batch production-Production of medium lot sizes of the same product or component. The lots may be produced once or repeated periodically. Examples include books, clothing, and certain industrial machinery.

4. Job shop production -Production of low quantities, often one of a kind, of specialized products. The products are often customized and technologically complex. Examples include prototypes, aircraft, machine tools, and other equipment.


Continuous-flow processes
Mass production
Batch production
Job shop production
Production quantity
Product variety