Biotechnology Plant Design:

Biotechnology Plant Design Lab: You need to have knowledge about the different phases of process design from idea to plant understand the methodology for feasibility studies of biotechnological processes be familiar with how technology economy market and legislation interacts in a feasibility study be familiar with the work of a project group including knowledge on some common tools for project management understand the basis for commercialization of business ideas such as market valuation access to IP and financing.

Biotechnology Plant Design

This article presents an idea of the design construction and validation issues to be considered for a GMP Biotechnology Manufacturing facility. Topics to be covered include architectural considerations equipment utilities materials of construction and computerization FDA expectations for biotech manufacturer.

It will be handy if you get some short research projects Discussions of current reference articles and case studies.

You need to consider all these below topics for a Biotechnology Plant Lab Design:

1. Overview/Project Life Cycle/Master Plan
2. Bulk Plant Design from a Process/Product Perspective
3. Bioreactor/Downstream Equipment Design
4. Facilities Design Overview/Architectural Considerations
5. Utilities/Materials of Construction: Properties and Selection
6. SIP/CIP
7. HVAC/Sterile Piping
8. Containment/Safety
9. Instrument Controls/Software Validation
10. Computerization/CIM/POM
11. Facilities/Utilities Validation
12. Approaches for the smaller biotech manufacturer
13. Contractual considerations
14. Licensing
15. FDA perspective

Biotech Laboratory Construction

Integrated analysis of material and energy balance

The material balances and energy balances in the process analysis design project procedure environmental regulations in setting up the plant and the cost estimation.

- Process plant-design development
- flow sheet development
- Equipment design and specifications
- Computer aided design
- General overall design considerations
- Environemental regulations and safety
- Cost Estimation - Profitability analysis of investments
- The design approach - Engineering ethics in design.
- Problems in material and energy balances
- Computer Aided Design

Plant location - Factors involved:

- procedures for plant location
- preparing the layout of plants the
- storage methods and the materials handling in the industry.

Selection of plant site :

- Plant layout - Preparation of plant layout
- Plant operation and control
- Maintenance and utilities
- Storage and Material Handling

Process creation - Batch versus Continuous

The configurations of the Raw material and product specification bioreactors & the design aspects of different bioreactors and its constraints.

- Process specification
- Fluid flow and mixing
- Problems in the fluid flow and mixing
- Calculation of impellar diameter
- Calculation of impellar speed and power

Process Design - Types of process design:

- Process flow diagrams
- Problems in the design of bioreactors
- Problems in the design of bioreactors
- Problems in the design of bioreactors

Design of reactor systems :

- Power requirement for gasand ungassed reactors
- . Design of extraction equipment
- Design concepts for membrane separation
- Design of filtration equipments
- Design of drying equipments
- Estimation of capital investment
- Estimation of operating cost
- Uncertainty analysis

For detailed study of mentioned topics please go through:

- Plant design and Economics for Chemical Engineers Max S. Peter,Klaus D.Timmerhaus et.al.,
- Chemical Engineering and Plant Design Ullmann's
- Bioprocess Engineering Principles Pauline M. Doran
- Biochemical engineering fundamentals James E Bailey
- Bioreactor design A.H.Scragg
- Process Design Case studies Scott R & Macleod