BE110
Cell Manufacturing for Engineers Online Course

Module 1 - Promises and Challenges of Cell Therapy

- The Promises of Cell Therapy
- The Challenges of Cell Therapy
- Cell Therapy Primer Pre-Test
- Cell Therapy Primer

Module 2 – Cell Collection

- Activity 1: Cell Donation
- Collection of Peripheral Blood Cells Using Apheresis
- Collection of Bone Marrow and Other Tissue
- Collecting Cord Blood Cells
- Collection of CAR T-cells
- Transportation of Cells After Collection
- Activity 2: Engineering Challenge in CT Role
    - Long Term Storage of Cells

Module 3 – Cell Manufacturing Operations/Supply Chain and Upstream Processing

- The Cell Therapy Supply Chain
- Upstream Cell Culture
- Upstream Cell Culture Environments and Media
- Upstream Cell Characterization
- Upstream Genetic Modification of Cells

Module 4 – Downstream Processing

- Cell Harvesting
- Cell Washing and Concentration
- Cell Separation and Purification
- Determining the Purity, Identity, and Potency of the Final Cell Product

Module 5 – Cell Manufacturing Facilities

- Manufacturing Models
- The Regulatory Landscape
- Activity 3: Careers in Cell Therapy Follow-up
- The Cell Manufacturing Facility
- Facility/Process Requirements
- Devices and Products

Module 6 – Delivering the Final Cell Therapy Product

- Process Monitoring and Lot Release Criteria
- Cell Product Storage and Transportation
- Cell Therapy Administration Methods and Point-of-Care Protocol
- Scalability and Automation in Cell Therapy Product Delivery

Module 6

- Practical advice for competent FEA-
  - Description of various items of the method to improve an analyst's competence
  - Tips on how to model various boundary conditions and reduce error
  - Discussion of various other FEA capabilities not covered in other modules
  - Known pitfalls