

Module Synopsis and Duration for Career Conversion Programme (CCP)
Place-and-Train for Advanced Biopharmaceuticals Manufacturing
Professionals

No	Module Title	Duration (hr)	Outline
1	Follow Good Manufacturing Practices	8	Provides basic knowledge & skills to follow standard operating procedures & contamination control procedures, report and record abnormalities when carrying out their tasks in a manufacturing or process environment.
2	Apply Continuous Process Improvement Techniques	15	Covers skills and knowledge in applying continuous process improvement techniques and be able to put it into practice at their workplaces.
3	Apply Safety in Process Plant	21	Covers the skills and knowledge required by the worker to be able to accurately identify process occupational health and safety hazards, and assess risk in a process environment, as well as follow safety instructions.
4	Operate Inoculation and Fermentation Reactors	40	Covers knowledge and skills to prepare and perform fermenter set-up, fermentation medium sterilization, fermenter inoculation, fermentation monitoring and control, cell harvesting, biohazard waste treatment for disposal and fermenter cleaning.
5	Operate Single-Use Technologies	18	Covers the skills and knowledge required by people to operate single use technology which includes preparing single use equipment for upstream process operations; performing sterile connection and disconnection and validating single use equipment.
6	Operate Tangential Flow Filtration Process Equipment	18	Covers knowledge and skills to setup tangential flow filters as well as perform integrity testing, basic operations on tangential flow filtration equipment. The learner will also have the basic knowledge and skill to reinstate tangential flow filtration equipment.
7	Apply Aseptic Cell Culture Techniques	40	Covers knowledge and aseptic techniques to handle cell cultures – both microbial and mammalian which include how to maintain cell cultures in a pure state during the upstream and fermentation stages. It also includes the competency of how to identify and maintain requirements for aseptic environmental and processing conditions as well as to maintain viral clearance barriers during all stages of manufacturing.
8	Illustrate a Lifecycle Plan for a Manufacturing Facility	30	Covers the ability to apply pharmaceutical science and engineering concepts to define the life cycle phases associated with the design and operation of a typical pharmaceutical facility, including conceptual material balances, site master-planning and detailed design, construction, commissioning and

			qualification. Personnel are also required describe an overview of operation & maintenance and continuous improvements through to the stage of plant retirement and decommissioning.
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